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Dyeing of Random Effects on Yarns

Former Methods Employed of Modern Machiney—Steps in New Process

By JOHN SOMMERVILLE

IN THE days before Random machinery was as common as it is to-day, many and varied were the different methods used to attain the desired result. In my first attempts on cotton yarn in the skein, I had the skeins bound at the necessary intervals with tapes—seamer's waste stretched out—and when ready for dyeing we threw them into a tub of boiling water, in which we had previously added 2 pounds soda ash per 100 gallons dye bath, and 1 to 3 pounds Monopole oil. They were boiled until the untied portions of the skeins were wet out, usually about five minutes, but it wasn't advisable to continue the boiling out any longer than was absolutely necessary, as the extra boiling caused a certain amount of wetting out under the tied parts, which allowed a certain amount of dye to penetrate the parts that were required to be left white. A direct cotton color was added to the bath in sufficient quantity, the most common being pinks, blues, violets and light browns. The boiling was continued again in this case, only until the dye had penetrated the untied portions. Needless to say, we did not do many batches in this manner, not because of the results, which were satisfactory enough for the time, but on account of the time consumed in the tying, and the very small production possible.

The next method tried was heavy mineral tanned leather straps, fastened on the skeins at the required places, and held by a metal buckle. We had only six made for a start, as we didn't have much faith in the leather manufacturer's claim that they would stand boiling. Our lack of faith was justified, for after a short period of boiling the leather became quite tender and the straps fell to pieces.

The next method tried was the use of two pieces of 4 x 2 scantling about 3 feet 6 inches long, with a 1-inch hole bored in either end of one of the pieces, the distance between the holes being the length of the stretched out skein. The other piece of 3 x 2 had a 1-inch hole at one end and a slot 1 inch wide cut in from the edge at an angle of 45 degrees. The yarn was stuck up on a ¾-inch iron pipe the same length as the Hussong stick; then one of the pipes was put through the holes in the two pieces of scantling, one at each end of the pipe; the other pipe was then pulled out tight, to stretch the yarn, then the one end of the pipe was put through the bottom hole of the one scantling and the other end then pulled tight, and then slipped into the slot in the other. The yarn was now stretched out tight between the two pieces of pipe, and there was no overlapping of the skeins. We then placed two flat pieces of wood 2½ inches wide and about ¾-inch thick along the skeins, drawing them up tight by means of brass bolts and wing nuts with the necessary washers. After the required number of clamps were put on, the yarn was hung in the Hussong machine by one of the iron pipes in the usual manner, the other pipe hanging down near the bottom of the machine. About one-half of the regular number of sticks could be used; more than that interfered too much with the circulation of the machine. This method made a very sharp, clear-cut effect, but was too slow and laborious to be practicable.

We next tried putting knots in the skeins at the places to be left white. The same method of procedure was used as in the first process, but even more care was necessary in this case in boiling out and dyeing not to get the inside of the knots wet-out and penetrated by the dye. Even under the best conditions the outside layers of yarn in the knots was dyed. It was a slow process, also, the knotting up of the yarn took a long time, the work being done by girls at the reeling. After the dyeing came the hardest part, the untying of the knots. If the knots were pulled up too tight when being first tied, it made the work of untying them very hard, because they shrank so much during the dyeing. Then, again, if the knots were left too slack after dyeing, the skeins would be very nearly solid, so that the tying of the skeins required considerable judgment. However, with all its attending limitations, we dyed many thousands of pounds of yarn by this method. It was un-

fortunate in a way that the knots came out much easier when the skeins were very hot. For this reason we didn't rinse off after dyeing but, as soon as the liquor had run off, we threw them out of the dyetub with forks, and every man available started untying while the yarn was hot, and as the yarn began to cool we threw pails of boiling water over it, to keep it heated up. It was hard on the fingers, but we soon learned to do the work without very much discomfort.

Conditions are changed now. There are quite a number of machines on the market which produce the same and many other effects which combined impossible under the old methods of working, and with speed, and ease of working, which leaves nothing to be desired. One of the first patented processes was the Ainsworth's method. In this the desired effect was obtained on the winding machine. By means of cams the yarn was intermittently depressed on a roller which ran in a trough containing the dye solution. The author never had any actual experience with this process so is unable to enlarge on the merits or demerits of the system. There was another machine invented called the "Randomtex." This machine dyed the yarn on the usual paper cones. The method of procedure was first to place the cone on a metal cone holder, pulling a lever which caused sharp projections to come through holes in the metal cone and pierce corresponding holes in the paper cone. The cone was then transferred to another similar cone holder, this one being connected to a vacuum pump arrangement which caused a suction through the yarn on the cone. The dye was contained in a glass cup similar to an oil cup with a drip arrangement, as the dye solution dropped on the cone it revolved slowly and the suction pulled the dye through to the center of the cone. This process was very soon sold out to the Eclipse Textile Devices. The latter firm being already in possession of the Vaness Patented Random Dyeing Process which will now be described with a little more detail, as it is the method which the author has been using since discontinuing the knotted skein process.

In this method the yarn, if cotton or wool, is dyed on cones either Foster or Universal cones. Rayon is dyed in a different type of machine, the compactness of the wound rayon being responsible for the difference in the machine design.

A rough outline of the procedure is as follows: Place the cone on a cone holder, screwing it to the right to lock it in position. The cone holder is itself attached to a platform, which by means of a lever can be moved forward onto, and back away from, two or more needles, very finely pointed and grooved, held in a horizontal position. When the platform has been moved forward and the needles are imbedded in the cones, a foot pedal is depressed, causing two dogs on the loose pulley to engage with a recess on a plate, which is attached to the shaft that operates the pump. Each revolution of the shaft causes the pump to discharge a quantity of dye through each needle into the cone as far as the paper cone. The slack pulley revolves at 80 r.p m., so that the pump is capable of the same number of shots per minute. When the platform is moved back away from the needles, the cone holder automatically makes 1/16 of a turn bringing a fresh dry portion of the cone round opposite the needles ready to be impaled on the needles and receive another charge of dye. It takes approximately 50 seconds to do a cone by this machine and 1,200 to 1,500 in a 10-hour day is a fair average daily production.

When the machine was first introduced it had a very small tank alongside the pump, from which it drew its dye solution. There were only two single needles, and a dye solution containing 40% of denatured alcohol was used. By lowering the surface tension of the solution it was enabled to penetrate the unboiled, tightly wound yarn, even though the solution used was used cold. The alcohol also caused the dye to spread and make a wide band; in fact, the width of the band was partially controlled by the alcohol concentration and by the length of the needle Colette.

The dye solution spread by capillary action along the fibers, and it was possible to use this property to produce different effects; e. g., with a mixture of colors it was sometimes found that one or more of the colors would creep along the fibers more than the others, giving a band with its edges shaded a different color. By mixing a small percentage of a basic color along with a direct color, the effect could sometimes be accentuated.

When using the alcohol method it was unnecessary to extract the cones. They were placed in a drier at a moderate temperature, and in the morning they were dry enough to be wound and knitted, even if the yarn was a little damp on the cones, quite an appreciable amount of drying taking place in the winding.

However, the cost of alcohol ran the price of the process up. Coupled with the unpleasant smell, and slightly toxic effect, it had on the operatives inhaling it all day, headaches and a dull feeling of lassitude were induced. It was only a short time before the company perfected a process, doing away with the high-priced and objectionable alcohol solution, using only the dye in a water solution with a small addition of a Random dyeing assistant. However, using the all-water process it was necessary to extract the cones before placing in a hot air drier. With the alcohol solution extracting was unnecessary, and the cones dried overnight without requiring to be put in a drier. However, the advantages of the water process by far outweighed any of the small disadvantages, and the extra labor charges were much more than offset by the saving in alcohol. The first extractor the Eclipse textile devices put out had six small horizontal baskets, each basket holding one cone. The baskets were set in three pairs with three baskets open to the front, and the other three to the back with the baskets being horizontal. If the cone was a little too small, or if the cone wasn't properly pushed back into the basket, it was

liable to fall out. Another disadvantage was that the operator had to walk around the end of the machine when loading and unloading. The manufacturers have, however, got out a new type, which has only four baskets set in a vertical position, and it is only necessary to drop the cones into the baskets, and there isn't the same chance for the cones to jump out as in the horizontal type.

Mention should be made of the fact that the water solution penetration was very much facilitated by the use of a steam-heated dye bath. The necessary pipes and valves were part of the installation, and a temperature of 140° F. is quite high enough for direct colors, or acid colors on wool, although 160° F. is better for the latter.

Returning to the extracting process, two minutes' run is usually sufficient to expell 66 to 67% if the belts are all tight, and the machine is running up to its designed speed, which is 1,800 r.p.m. Longer running does not increase very much the amount of water taken out, and is not worth the extra running time. The average weight of our cones is 2 pounds 2 ounces, and according to how the pump stroke is adjusted from 2 to 3½ pounds of dye solution can be injected into each cone; i. e., with a good, long stroke our 2-pound 2-ounce cone weighs 5¼ pounds after dyeing, and approximately 3 pounds 2 ounces after extraction. From 12 to 24 hours in the drier at a moderate temperature (160° F.) is sufficient for drying. If the temperature is too high the outer layers of it become baked and hard. If the best results in the knitting room are wanted it is a good plan to steam the yarn gently for 30 to 60 minutes in a steamer with moist steam; a small room or an unused dye tub of suitable dimensions can easily be hooked up for the purpose.

When a dyer has the machine installed for a little while a great many varied results may be obtained. Two, three, four or five bands of color can be put on each cone by the use of two or more dye tubs, with the pump suction pipe connected to the different tubs by a two, three or four way fitting, and taps for shutting off the different lines.

For convenience, where variegated cones are the rule, a four-color machine has been perfected which has four pumps and four dye containers, so that four bands, each a different color, can be put on a cone at the one operation.

Another modification that may be made with a little adjustment is to have vertical stripes on the cones in place of those round the circumference. In the knitting operation the vertical stripes give a much shorter line to the Random effect than the regular method.

When dyeing wool on the machine the dye solution is modified slightly, higher temperatures are used, and an addition of acetic acid is made to develop the color. Direct colors may be used, but as a rule neutral dyeing wool colors give cleaner and brighter dyeings. Palatine chrome colors and the Neolan types may be used for the fast color work, but in this case the steaming after drying performs the additional function of developing, and fixing of the color-chrome-compound on the fiber, and must be continued for a longer time.

The dyeing of vat colors of the Indanthrene type on cotton introduces certain difficulties due to the oxidation of the leuco compound of the dyestuff tending to be incomplete. Probably by this time the manufacturers have found a suitable method. I suggested to their demonstrator impregnating the cones with the reduced dye, then shooting a solution of an oxidizing agent such as sodium perborate into the cone alongside the color band while standing the oxidizing solution would tend to diffuse into the dyed portion, and the extraction would tend to complete the oxidation of the color.

In another experiment a metal cone made the same size as the paper cone was used, and where the bands of color would come the metal cone was perforated with bands, which in each case were slightly wider than the corresponding color band. The perforations in the metal were made as numerous as possible while still retaining the strength of the cone. Next to this there was a wooden disk, with a ¼-inch hole through the center of it, which fitted into the base of the metal cone tightly. After dyeing the cone with the vat color, the cone was put in the extractor, and the water expelled. On account of the perforations in the metal cone, air is pulled through the perforations in the colored band and oxidizes it.

Now to remove the dilute caustic and hydrosulphite residues the wooden disc is inserted in the base of the metal cone, and a small jet of water or dilute perborate solution is played, while the extractor is running, from a thin flexible tube, into the hollow metal cone. The woolen disc prevents the liquid from being thrown out, and the centrifical force pulls the rinsing or oxidizing medium from the inside through the yarn, and out of the cone to the waste pipe. On account of not having any call at the present time for vat colors, the experiment was not further than to satisfy myself that vat colors could be dyed satisfactorily. For production work a supply of the metal cones would be required. The cost of these would be offset by the length of time they would be available for use. In place of the rubber hose, the extractor could be piped to the water supply, and six 3/16-inch crane jets, which are on a swinging fitting, could be swung down when not required, and then swung up and their ends inserted into the holes in the discs when the washing operation was necessary.

I have always been of the impression that a modification of the dyeing method could be applied to the dyeing of tops in the ball for Oxford grays, heater mixtures, in place of the existing top dyeing methods and Melange effects.

In the ordinary process of dyeing cotton yarn on the cones for underwear randoms, there is very little that can go wrong. I have run a machine steadily for four

years without mechanical trouble of any kind, careful watch must be kept on the needles, to see that they do not develop burrs, since these cut the yarn unmercifully, and as it is some time before the yarn gets to the winder, unless the defect is caught, quite a lot of yarn might be cut. It is usually quite easy to detect the burr on account of the rugging effect felt when the yarn is being impaled on the needles, or when the cone is being pulled away from the needles. In any case it is a good idea for the operator to get into the habit of examining the needles every hour. Occasionally the pump might fail, and usually it is a piece of lint in the ball valve supplying the needles, or the non-return valve in the reservoir suction line gummed up with a greasy accumulation.

Dyers' Accounts

Practical Articles on Their Special Features

By S. HOWARD WITHEY, F.C.I.*

A FEW years ago many color users and proprietors of dye, etc., works were accustomed to judge their financial position in relation to the business in which they were engaged, and to the outside world, by the balance standing to their credit at the bank. Allowance was made for some of the capital expenditure in the form of machinery, plant, etc., and if the balance of cash was greater at the end of the working year or period than it was at the beginning, the difference was looked upon as representative of the amount of net profit realized.

Changing Conditions

However reliable such methods may have been at one time, they are no longer available to the dyer. During recent years, enormous and far-reaching developments have taken place in dyeing and related textile-chemical operations, and also in calico printing. Many fabrics of a delicate nature have been introduced; experiments and studies are conducted along more systematic and scientific lines. Millions of pounds have been invested in the various processes, and at the present time Great Britain and the Empire are independent of outide sources of supply, while side by side with this enormous progress great developments and changes have taken place in the world's banking and commercial credit systems.

The Profit of Each Process

It is only necessary to consider the existing demand for machinery, the nature of the patents now being applied for, and the detailed classification of the materials used in the manufacture of chemicals and dyeware, to realize the importance and the value of suitable accounting methods. Apart altogether from future innovations, the dyer must be in a position to ascertain not only the amount of profit made on the business as a whole but the cost and efficiency at each stage. He must know the amount of profit or the extent of the loss under each heading, the exact cost of the chemicals, dyestuffs and labor involved, and at the same time these results will have to be tabulated in a convenient form. To be able to increase or even to maintain his turnover in face of present and future acute competition, the dyer will have to be constantly aware of the sources of his profits and the causes of his losses, and will have to decide in good time whether or not certain processes should be developed or suppressed.

With the advance of science and the more minute subdivision of labor processes comes the need for controlling the pigments, acids and dyestuffs used. It is not sufficient to guarantee that the dyeing and mordanting agents, etc., are taken into stock in sufficient quantities at the right time. The issues of materials and stores should be subjected to an effective internal check calculated to avoid any errors, excesses and irregularities, and the records should enable the precise stock under a given heading to be readily ascertained.

Then, there are the factors of depreciation and waste to be dealt with. Before it is possible to decide whether the results of the year's trading compare favorably with previous periods, or with the turnover or the invested capital, some uniformity will have to be established as to the sums written off the book value of machines, ranges, pumping equipment, dyeing plant, vats, tanks and other wasting assets, for if the final accounts are to be relied on, the charge for depreciation must be equitable as between one period and other. Moreover, a careful discrimination will have to be made between capital and revenue expenditure, otherwise the balance sheet will not exhibit a true and correct view of the state of affairs.

In the matter of costing and the compilation of data relating to output, the value of the materials used in each department, the conversion costs, and the overhead expenses will have to be shown. The percentage of labor charges to be debited to repairs will have to

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be decided in the light of the figures shown in the working books, which should be reconciled with the financial books, and all variations from the standard will have to be revealed. And even such comparatively unimportant matters as the amount received in respect of containers salvaged or returned to suppliers should be recorded correctly in the books of account. In short, the dyer—whether in business on his own account, a partner of a firm or a director of a large limited liability company—should at all times be quite familiar with the principles and special features of dyers' accounts.

Recording Orders

The foundation for all the entries to be made in the financial and costing books will be the orders received, and consequently some consideration should be given to the method to be adopted for recording the orders. No enterprising dyer will deny that advertising and other publicity methods play a vital part in the creation of demands for certain products and processes, and whether they come to hand through the medium of the post, from agents or travelers, or over the telephone, the orders should be booked in a systematic and businesslike manner, and not allowed to accumulate in a drawer or on the office desk.

Broadly speaking, there are three ways of recording orders. Some dyers prefer to use loose printed sheets as a part of the slip system, the sheets being subsequently bound in book form to constitute a kind of order book and sales book combined. A considerable amount of time and labor may often be saved by adopting this method, but experience has proved that in operation it is very difficult to insure that no sheets are filed away before the jobs have been completed, and to guarantee that none are lost or mislaid when the time arrives to charge the amounts involved against the customers' personal accounts.

The Duplicate Book Method

Another method involves the use of a duplicate book, or manifold order book, the particulars relating to each order being set down on the pen or pencil carbon-copy principle, and the original form handed to the person or transferred to the department immediately concerned in the fulfilment of the particular job. If two copies of each order are made, one copy is usually passed on to the office for use when recording the sales transaction, the other being retained in the book for purposes of future reference. Upon the execution of an order, both the original form and the copy are canceled, the former being filed away and the latter priced out, and although this method possesses distinct advantages over the use of loose sheet it carries the serious disadvantage that orders may be priced out before they have been actually completed.

By far the best method of recording orders consists of entering them in a specially printed book kept for this purpose. Each entry should show the date, the name and address of the customer, particulars of the customer's requirements, and the rate or price. Columns should also be provided for the insertion of the date on which the job was finished, the date of supply or dispatch, and the day book or sales book folio; while an outer margin for any remarks connected with the work or the transaction will be found useful. As soon as all the orders or any one page of the order book have been fulfilled, as shown by a scrutiny of the "sales book folio" column, it is a good practice to rule a neat line across the page from corner to corner, thereby facilitating future references. Those orders not marked off will, of course, constitute the unfulfilled orders to which attention of the dyer or departmental head should be constantly directed, all instructions that appear to have been outstanding for an unduly long period being subjected to inquiry and investigation to prevent any being overlooked or only partially carried out.

Although the dyeing of textiles involves the use of synthetic dyestuffs of all shades, necessitating a careful testing of colors and intermediates and a more or less detailed classification of the acids, mordants, materials and stores purchased by the dyer from time to time, the extent to which the actual dyeing processes should be analyzed in the books of account will depend very largely upon such factors as the amounts of different materials dyed and the variety of the shades produced, and will be governed by the requirements of the individual dyer.

All sales which have been transacted on a credit basis, including the charges made by the dyer for specific dyeing operations performed on behalf of private or trade customers, should be entered up in a sales book, or day book, for which there is, of course, no standard ruling. Where no classification of the transactions under two or more headings is considered to be necessary or desirable, two money columns in this book will usually suffice, one column being reserved for details and the other column for the total price in each case; but if it is deemed advisable to dissect the sales either for costing purposes or in order to be able to ascertain the amount of gross profit made under each heading, a number of money columns will have to be provided. In those cases where only one kind of material is dyed, a classification of the different shades —such as light shades, medium shades, deep shades and multi-colored effects—may be useful.

Entries in the Day Book

Each entry made in the day book should give the quantity of material dyed, the shade or shades produced, the customer's name and address, the price, and, where applicable, the deduction in respect of trade dis-

count as distinct from cash discount. If any unusual conditions or stipulations have been agreed to, or if the customer has specified any particular method of delivery, this should be stated in a "remarks" column, and when the details have been entered up and independently checked, the invoice should be made out and a copy of it retained for purposes of future reference.

Some dyers prefer to type their invoices and to file the carbon copies as a part of the slip system, but generally speaking it will be found better to use a press-copy invoice book, each invoice being made out in copying ink and the copies left intact in the book. Whichever method is adopted, some care will be called for to insure that all additions, adjustments or alterations effected after the invoice has been made out are also made on the copy retained. When copies are placed on a spike file, they should be removed at the end of the month, wrapped up in a neat bundle and indorsed, leaving the file available for documents relating to the current month's transactions.

The Sales Account

The effect of selling dyed goods on credit is to reduce the dyer's stock and to increase the book debts or sundry debtors, and consequently a double entry will be necessary, the value going out being credited to a goods or stock account and the value to come in being debited to the customer's personal account. This essential double entry is effected by posting each amount recorded in the day book direct to the debit side of its proper account kept in the sales or customers' ledger and by transferring the monthly or other periodical totals of the day book to the credit side of a sales account kept in the impersonal ledger. Each amount posted to the debit side of a sales ledger account should show the date of the invoice, the words "To Goods" or "To Sundries," and the day book folio, the page on which the account appears in the ledger being then inserted against the entry in the day book to show at a glance that the amount has been actually charged up in the books. Upon no consideration should a ledger folio be set down against a day book item until the amount has been debited. When transferring the total of the day book to the credit side of the sales account, the ledger entry should state the date, viz.: the last day of the particular month or period, the words "By Sundries as per day book," and the folio, the page of the ledger being afterward inserted underneath the total as shown in the book of original entry. In some cases it will be possible to divide the sales account into sections headed "acid wool," "union," "direct cotton," "chrome and mordant," "vat," etc.

It sometimes happens that after the material has been dyed, the shades produced, although very close to those desired, are rejected by the customer, or the work is found unacceptable for another reason. In such cases the dyed material may be returned, or an allowance may be made by the dyer in lieu of actual returns, and it will be just as necessary to record these facts in a proper manner as it is to book the original sales.

Providing the number of returns inward transactions, including all allowances, is really small, they can be entered at the end of the dyer's day book, a number of pages being reserved for this purpose. But if they are at all considerable in number the returns and allowances should be detailed in a separate credit book in order that the clerical work may be suitably split up and apportioned. If the sales have been classified under a number of heads, the returns and allowances will have to be dissected in the same manner, otherwise two money columns ruled in the credit book will suffice.

Credit Notes

Each entry made at the end of the day book, or in the sales credit book, as the case may be, should correspond with the details enumerated on the credit note which was forwarded to the customer, and a copy of which has been kept by the dyer, the total amount agreed upon as the value of the returns or as an allowance being posted direct to the credit side of the customer's personal account, this sales ledger entry giving the date of the credit note, the words "By Returns," "By Credit" or "By Allowance," and the folio of the subsidiary book. At the end of the month or other convenient period, the total of the returns and allowances should be transferred direct to the debit side of the sales account kept in the impersonal ledger, with the date, the words "To Sundries," and the folio, or it may be deducted from the corresponding monthly total of the day book before the latter figure is recorded on the credit side of the sales account. Where a duplicate credit book is kept on the pen or the pencil-carbon copy principle, the copies of the credit notes may serve as the returns and allowances book, although from the viewpoint of a division of the work a separate credit book has distinct advantages.

Compared with the volume of credit business, the cash sales are not likely to be very numerous, and the majority of dyers will not need to keep a cash sales or takings book. Amounts of cash received from customers who prefer to remit with order or upon delivery should be recorded as separate items on the debit side of the general cash book and posted direct to the credit side of the sales account with the date of receipt, the words "By Cash," and the cash book folio. The form of cash book will vary according to the particular method which is in operation for handling and dealing with the cash itself, and in the next instalment of this series the most appropriate rulings will be indicated, together with the method of recording cash received and paid, and discounts allowed and obtained, and of keeping and balancing the personal accounts of customers and debtors.—*The Dyer and Calico Printer.*

Prompt Action in Mill Accidents

By FRED. GROVE-PALMER, A.I.C.

IT IS a matter for congratulation that when an accident happens in the dyehouse or the other parts of the textile mill, it is not, as a general rule, of a very serious nature. The modern trend of the "Safety First" idea has borne good fruit, and the greater number of places in which, in former times, bad and even fatal injuries might be sustained have now been so carefully guarded that the risk has been considerably minimized.

In addition to the lessening of the dangers to the operatives, many of the more important mills have installed a hospital in which all injuries, slight and serious, are adequately attended to by a staff of properly trained nurses and doctors having special experience in dealing with the type of hurts that are apt to arise.

Some figures that were published some time since showed that of the total number of injuries received during work in textile mills as a whole, around 35% are attributable directly to the machinery and the other 65% cannot be so classified. Of the first class of injury, it has been pointed out that a considerable reduction in numbers can be effected by additional guards and shields, together with a better education of the people who are employed in handling the machines; but with regard to the second class, it is only by dint of teaching the workers constantly how to avoid the risks they run that any advancement can be made. The subdivision of the first class of accidents, based upon figures issued by an insurance company specializing in this kind of work, is given in the following tabulation:

	Per Cent
Warping and weaving machines	10.2
Spinning, winding and throwing	9.2
Carding room	5.3
Elevators and hoists	2.4
Breakers and teasers	2.0
Miscellaneous	5.9
Total	35.0

The same authority has subdivided the "non-mechanical" accidents on the following lines:

	Per Cent
Handling raw and finished goods	22.0
Falls and stumbles	19.6
Hitting against things	8.2
Falling goods	4.6
Hand tools	3.3
Trucks, barrows, etc	2.0
Chemicals	1.1
Steam	0.8
Miscellaneous	3.4
Total	65.0

It must be noted that this does not claim to be a national classification, but it will serve to give some indication of the nature of the accidents that are encountered in the daily routine of the dyehouse and mill, add for which those in charge need to make some preperation, not only by way of supplying medical treatment of some sort when they occur but also by some systematized method of educating the whole body of operatives how to avoid them. This teaching will be of little avail unless it is properly organized; sporadic attempts are failures, and it is of no lasting effect merely to tell someone he or she is doing wrong when it happens that someone in authority is passing at the time. The fact that all the latest and most scientific devices for the safety and protection of the operatives have been put in does not necessarily make for safety unless they are educated to understand what the devices are for.

A well-known mill manager said to the writer on one occasion, while discussing a "foolish" accident which had all but ended fatally, "The amount of trouble that some of the people will go to in order to get themselves killed or maimed, in spite of all we can do to prevent it, shows a zeal that might well be exercised in doing really protective work."

The work of the dyehouse and mill is not particularly hazardous; certainly not more so than crossing a busy thoroughfare or playing a ball game. There are risks and dangers everywhere; a man working in the back yard or his town lot is open to injury. The dangers in the dyehouse are guarded against, so far as may be possible; the same thing applies to those in other parts of the mill. All well-managed concerns, for their own credits sake, use every endeavor to prevent accidents. In the so-called hazardous industries —such as, for example, iron and steel, the manufacture of explosives, fireworks and matches, the making of corrosive acids—every person employed in the factories is fully aware of all the dangers that lie around him and acts accordingly. This is true in theory, at any rate; though in actual practice, if the work is to be carried on it is sometimes necessary for the workmen to take a risk in an emergency, and in the majority of cases when this is a possibility they receive an adequate remuneration to cover it. This does not apply to the textile industry, where we have very little danger, and as a result the workpeople have not

before them an ever-constant consciousness of impending injury; there is nothing much to guard against. Something may happen, of course, but you can't see what it is or where it is coming from, and consequently everything seems perfectly safe. This undoubtedly leads to a slackening of the lookout, carelessness creeps in, and that familiarity which breeds contempt is set toward the plant and machinery.

It is, of course, fatal to approach the day's work from the other extreme: to crawl behind every pile and pillar for fear something is going to get up and hit out all around. The worker with that outlook has no better chance of safety than his care-free, clumsy friend who has no thoughts at all. The operative who gives the greatest satisfaction from the safety point of view is the man or woman whose attention is entirely on the work in hand, who brings sound horse sense and considered judgment to bear on the matter; in other words, one whose brain is employed in assisting the hands. In that way the possibility of danger is minimized. There are such workers in plenty, and they can be trained to it.

Every moving machine is a possible source of danger; the same applies to steam valves, carboys of acid, piles of cases or bales; but some people never understand it until they get in the way of something that is out of place. These people are a danger to themselves—we could bring ourselves to bear that; they are also liable to cause injury to their fellow workers—this is indefensible. A specially flagrant case of this form of thoughtlessness came under the writer's observation some time back. It was part of the duty of one man in a section of the dyehouse to prepare a bath of cellulose dressing for treatment of one of the fabrics; the specific gravity of this was important and the operative in question was required to test it. One day toward the close of the shift he was getting the solution ready and, finding that he had some little difficulty in making a reading of the hydrometer, he pulled a box of matches from his pocket and was on the point of striking one to get some light on the subject when the foreman caught sight of him. That worthy, knowing that there should be no matches in the building and realizing the danger to everybody, did not waste time in preliminary conversation; he stopped the whole business by a well-placed kick right on the most inviting spot. The man was annoyed at being treated in this cavalier fashion, but the foreman justified himself at some length; in fact, as he explained later, he did not consider that he had forgotten anything that might be said under the circumstances. Anyway, he saved the lives of the culprit and possibly of those working in the same building, quite apart from the damage that might have been done to the machinery and plant.

It was once said in a lecture on the subject that though it is possible to make a machine foolproof, no one can do the same with a human being. When a machine has been installed and set going, it will not go beyond certain definite limits and it keeps on doing the same thing over and over again; but no one can foresee what a human being is going to do; if it were possible, there would be no need for safety regulations. All we can do is to educate the human along the lines he is expected to take, and after that hope that he will keep to them. But at the same time all preparations should be made against a slip-up. This should not be read as any disrespect to one's fellow workers; far from it. It is simply a plain truth with which every dyehouse manager or mill supervisor will agree; any who do not may thank their lucky stars for it, but they should not relax their control any, for such good fortune cannot continue indefinitely.

Men and women have to earn their living; there is no argument about that. They have to do it in company with others in these days of scientific production. While one worker on his own can be so careful that no accident occurs, when there are two or three the risks increase far out of proportion to the numbers employed. A piece of soap dropped from a dye beck, an unbuttoned overall, a floor grating or brick displaced, a broken packing case or barrel, a mug of acid, a worn belt, even a playful prod in the back—any of these, and many others, is quite apt to result in a more or less serious accident. The mill's safety organization can only justify its existence if it succeeds in checking the dangers that arise from these simple causes. It has been argued that better results may be obtained by bringing in a "safety-first" expert from outside, but practical experience is not in agreement with this. Factory workers in all industries have a tendency to distrust the stranger; they ask, "What does he or she know about our work?" There is a certain element of truth in this, and certainly it is a feeling that must not be despised. General opinion shows that better education results from the employment of some trusted officials within the dyehouse or from other part of the mill; someone who is known by the operatives to be a regular fellow, and who will be listened to with respect and interest. Above everything, there should be no highbrow talk, accompanied by large sheets of printed regulations; these are never read intelligently, even though the people may take an oath that they have gotten to know them by heart; so many sets of rules defeat their own object by being too profuse. It is the human touch that is wanted, the personal appeal of one worker to another, assisted by catchy slogans that are frequently changed. These should be snappy and have plenty of punch. A good one seen over a dangerous machine read, "Don't monkey with this. Perhaps your family needs you."

When there are rules laid down for the proper conduct of a section of the mill, let them be plain and straightforward in language; and, above all, let them

(*Continued on page* 127)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

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Newport Chemical Works, Passaic, N. J.

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Harold C. Chapin, Secretary, Lowell Textile Institute, Lowell, Mass.

Rhode Island Section—
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Carl E. Bick, Chairman, Real Silk Hosiery Mills, Indianapolis, Ind.
Clarence Wille, Secretary, Burson Knitting Company, Rockford, Ill.

Lowell Textile Junior Section—
Earle R. McLean, Chairman; Alfred J. Carbone, Secretary.

DECEMBER MEETING OF RHODE ISLAND SECTION

THE December meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held on Friday evening, December 20, 1929, in the rooms of the Providence Engineering Society.

Dr. Donald H. Powers, chief chemist of the United States Finishing Company, gave a very interesting talk, entitled "Rubber, and Its Application to Textiles."

About forty-five members were present.

A. NEWTON GRAVES, *Secretary.*

JANUARY MEETING OF NEW YORK SECTION

THE regularly monthly meeting of the American Association of Textile Chemists and Colorists, New York Local Section, was held at 8.20 o'clock on Friday evening, January 24, 1930, at the Alexander Hamilton Hotel, Paterson, N. J., P. F. Kingsbury presiding.

The routine business of the meeting was transacted.

Chairman Kingsbury—Our speaker this evening, gentlemen, is C. H. Clark, the Secretary and Treasurer of the Textile Research Council. He will talk to us this evening about the program of the Research Council. Mr. Clark! (Applause.)

C. H. Clark—Mr. Chairman and Members of the New York Section: I am here under a double misapprehension. For a number of years I have followed the research work of your organization with much interest and with more or less jealousy, particularly that part of your work that has to do with the Research Committee, and their activity in research and their efforts to expand it into a real pure and applied research program.

Last spring we had as our guest at our Atlantic City meeting Dr. Killheffer, your president, P. J. Wood and Dr. Olney, and we had a very interesting discussion on "A Possible Approach to Research." I was invited to attend your Philadelphia meeting, but unfortunately could not; but I have read in the AMERICAN DYESTUFF REPORTER with much interest the discussion of Dr. Killheffer and the others who took part.

I had always understood that every one of your members was sold on research, and that it would be entirely unnecessary for me to appear here as an evan-

gelist and try to sell the idea; but on my way over from New York I learned some things regarding the modern dyer, printer, bleacher and finisher that were decidedly new to me.

I understand that to-day all you gentlemen have to do who are engaged in that field of activity is to have certain formulas; that it isn't necessary for a man to have technical experience; that anyone can apply the formula. (Laughter.) Therefore the days of the old colorists and chemists are gone. Naturally it is going to be difficult to sell a program to men who simply apply formulas.

There is another misapprehension, and that is that I was to be only one of the speakers of the evening and it would only be necessary for me to occupy fifteen minutes or so. However, at the last minute I was told that I needed to go three-quarters of an hour. I assure you, gentlemen, I am not going to bore you at that length.

This double misapprehension reminds me of a story that I heard recently. I am afraid it is an old one, because while I heard it last Saturday night at a meeting of the Alumni Association of the Massachusetts Institute of Technology, I also attended a movie the early part of this week and almost the identical story was told there in a release from Hollywood that I am afraid was not very new. It has to do with a man somewhat inebriated who came into the railroad office in New York, if you happen to be in New York, or in Boston, if you happen to be in Boston. He went to the ticket agent and said, "How far is it to New York?"

The man replied, "Two hundred and thirty-five miles."

"How far is it from New York to Boston?"

"What are you talking about? What do you mean?"

"Well, how far is it from New York to Boston?"

"Just the same as from Boston to New York."

"Oh, no," he said. "It is a week from Christmas to New Year's, but it is fifty-one weeks from New Year's to Christmas." (Laughter.)

If I only had the ability as a storyteller and reconteur of Mr. Wood here I could probably string this address out easily to three-quarters of an hour and possibly double that length of time. (Laughter.) If he will volunteer to fill in between paragraphs I would be very glad to give him the opportunity. If not, you will find the subject possibly a little dry, particularly if you are all formula men, which I am confident you are not.

. . . Mr. Clark then read his prepared paper.

An Approach to Scientific Research

By Charles H. Clark

Secretary-Treasurer, Textile Research Council

THE present efforts of the Textile Research Council to interest its industry in pure and applied scientific research may be better understood if its beginnings and history are briefly sketched; like Topsy, it was not born, but just grew up. It was organized October 13, 1926, by nineteen members in this country of the Textile Institute, Manchester, England, practically all of whom had taken memberships in this organization as a necessary means of securing the research reports and other data published in the Journal of the Textile Institute, which is the official organ for research reports released by the various British textile research associations. It was a little group that had been brought together solely because of their mutual interest in research work, and because of their belief that an organization having this single objective might in time become a factor in stimulating interest in textile research.

It was organized as the Textile Institute Club, a title that was logical because of its members' British affiliations, but almost immediately it was given an opportunity to demonstrate that it was not pro-British and that it was without pride in its title by gracefully resigning its "Institute" to the Cotton-Textile Institute, then organizing, and taking its present title of Textile Research Council; therefore, if there is anyone who may consider the latter too ambitious for so small a group, it is the Cotton-Textile Institute that must shoulder the responsibility. It may not be out of place, however, to recall that some of the world's greatest men have been of small stature, and that certain men regarded as of ordinary mental capacity have performed wonders when the responsibilities of great offices or titles have been thrust upon them.

Franklin W. Hobbs, president of the Arlington Mills and of the National Association of Wool Manufacturers, was chairman of the organization committee, the other members being George L. Gilmore, proprietor Middlesex Bleach, Dye & Print Works, Somerville, Mass.; Edwin H. Marble, president Curtis & Marble Machine Company, Worcester, Mass.; Frank W. Reynolds, Lockwood, Greene & Co., Boston; C. E. Mead, then director of the Cotton Research Company, and C. H. Clark. George L. Gilmore was the first chairman of the organization and has been his own successor since then. C. H. Clark as secretary-treasurer and the following members of the executive committee have served from the start: F. W. Hobbs, E. D. Walen, agent worsted division, Pacific Mills, Lawrence, Mass., and A. M. Tenney, sales director, Amer-

ican Bemberg Corporation, New York City. Dr. W. F. Edwards, director of laboratories, U. S. Testing Company, became first vice-president in 1927 and has held that office since then. I emphasize this continuous activity of these officers, and also the fact that fourteen of the original nineteen members are still in good standing, as evidence that we have had the benefit of their continuous study of the approach to scientific textile research, as well as that of about twenty additional members. Although we have refrained from active canvassing for new members until we believed we had a definite service and plan to offer, nevertheless our small membership at all times has given us direct contact with all branches of the industry and its comparatively few research activities. The total has seldom exceeded thirty-five, and is now thirty-four. I am pleased to state that I identify ten of the latter as members also of the American Association of Textile Chemists and Colorists.

At the annual meeting October 26, 1927, the Textile Research Council adopted a formal set of by-laws, which calls for no further explanation at this time, in view of the fact that a new set embodying much broader powers is being drawn up for submission to members at the next meeting, than to state that we have two classes of membership, active and sustaining, and that the executive committee has sufficient power to authorize the raising of a fund for the financing of publicity and promotional work requisite to organize a modest research plan, and has so authorized. Excepting for necessarily limited service that the Secretary and members have been able to provide in answering queries regarding textile research matters, the principal efforts of the organization have been concentrated upon promoting more general interest in the research idea and in the development of plans for active scientific research of a co-operative character. The former has been the result largely of addresses by leading research authorities at our annual and semi-annual meetings and the liberal publicity given to them by the trade press. A few important textile researches have also been reported at these meetings and distributed in reprint form.

The developmental work that has led up to the modest but fairly definite plan for starting scientific textile research that was authorized by unanimous vote of the Council at its last annual meeting has been of two types—discussion and surveys. Constructive discussion has necessarily devolved to a large extent upon the executive committee and the survey work upon the Secretary, whereas in larger organizations they would naturally have been the work of special committees and might have been more quickly and definitely resultful. Three surveys have been conducted: one in 1927 on "Textile Research Facilities and Accomplishments in the United States," one in 1928 designed to show what other industries in this country have done to provide a specialized library and central source of research information, and another the same year that was confined to Council members and was designed to build up a list of specific textile research subjects of a fundamental and applied character. While the last-named survey was productive of many valuable suggestions, it was deemed unwise to carry it further until the fate of the library plan was recided, as the latter would become a fruitful source of such subjects.

The survey report on textile research facilities in this country was summarized as follows:

"There is an almost complete lack of pure or fundamental research and accomplishments in this country.

"There has been and still is little applied or developmental textile research, and practically all has been of an empirical character, with considerable duplication of effort and with a frequent lack of scientific conclusiveness.

"Our textile schools, universities and technical institutions as at present organized are unfitted to conduct efficiently and systematically pure or applied textile research work.

"By inference the need of some organized plan for the development of pure or fundamental research is a dire need of the industry, an approach to the initiation of which may be the organized effort of all the individuals or representatives of textile associations interested in such an objective. The same group should undertake the organization of a plan for furthering applied or developmental textile research.

"In the meantime everything possible should be done to encourage increased use for applied and developmental research of the institutional, governmental and private textile research facilities that have proved their efficiency and resultfulness, and the directors of these various research sources, together with those utilizing them, should co-operate to avoid duplication of effort and to advance textile research."

In several particulars that report as of conditions in 1926 would need to be revised accurately to reflect research progress since then, particularly as regards applied or developmental work, and also to credit the distinct progress of certain institutions in organizing for efficient, systematic fundamental research. Since then, also, there has been encouraging evidence of increased interest within the industry in scientific research; undoubtedly this is due in part to growing realization by textile manufacturers of the fact that the prosperity and rapid growth of several of the newer industries is founded upon scientific research,

and also to recent education of the industry in the value of merchandising, management, style and other economic research; but I believe that the American Association of Textile Chemists and Colorists and the Textile Research Council are warranted in feeling that the publicity given to their efforts to stimulate interest in scientific textile research have been partially responsible.

The Research Information Need

In the Secretary's minutes of the meeting of the Council's executive committee November 29, 1927, it is recorded that "It was the sense of the meeting that the first and most important need of a textile research program is the creation of a textile research library and central source of information." While that was the first formal record of the idea, I know that it was in the minds of all of the founder-members from the time of our first gathering; and this was natural, for they were members of the Textile Institute primarily to get textile research facts published in that organization's journal and were influenced by the desire for more textile facts to join the Textile Institute Club. Most of these founder-members and a majority of those who have since become members had learned, either by bitter experience as research or laboratory workers or as manufacturers or editors, of the great difficulty of locating facts of textile fibers, processes, finishes, etc.; and they not only recognized the need of a facile source of supply, but realized that a program of pure or applied research without this foundation would be slow, wasteful, and result in much duplication of prior effort and therefore in unnecessary expense. Possibly the textile editor whose staff is obliged to locate the answers to several thousand questions annually is able to visualize this need and the difficulty of filling it with basic facts quite as fully as can the average manufacturer or department head whose quest for facts is tempered by diffidence or some other inhibition.

As illustrating one of the penalties of failure to keep up to date in technical literature I will quote the following story from Furniture Record:

"Confronted by an emergency, a hustling young executive of an engineering firm toiled for weeks to perfect an idea—a plan to meet it. He commandeered not only his own thought but the services of others to evolve something to meet the exigency. Glowing with pride, he presented the solution to his chief.

"'Very good,' commented his superior. 'And how long did it take you?'

"'Three weeks, sir!'

"'Did you require much help?'

"'Well, it was necessary for Jones, Gray and Smith to work with me for a couple of weeks.'

"'So? Figuring your own time, then, and that of the others who aided you, the cost to the company was something in excess of $1,000, was it not?'

"'Yes, sir.'

"The big gun scribbled something across the paper the young man had presented, folded it neatly and handed it back to him, smiled grimly and said, 'Read what I've written when you get back to your office.'

"The notation by the chief, the young man found, was merely a reference to a certain page in a bulletin that the company had been receiving weekly. Upon turning to the page the young man found, in words of one syllable, and in a paragraph of space, the answer to the problem which he and others had labored three weeks to solve. The bulletin he had not read because he had been 'too busy.'

"So often we hear nowaday, 'I haven't time to read. I cannot spare the time from my work.'

"Let me say to you that the business man who has, or who takes, no time to read will soon be assured of reading the news of his own failure.

"Many a successful business idea, many a business salvation, has been tossed into the waste basket or left unheeded within its mailing wrapper.

"You cannot afford NOT to read."

The Research Information Plan

The Textile Research Council recognizes that a great central research laboratory, or series of laboratories, adequately equipped, staffed and financed, should be the ultimate goal of a well-rounded research program; but while organizing for that objective it believes it advisable under existing business conditions to concentrate upon a more modest plan that is an essential approach and foundation for pure and applied science, and that it believes can be financed for less than $100,000 as a three-year program. The idea is inadequately termed a library and central source of textile research information, and is the fruit of study of the whole subject by officers and members of the Council during the last three years and has the indorsement of many research authorities within and outside the industry.

The plan recognized the fact that scientific research must be slow, wasteful and inefficient, with unavoidable duplication of prior work, when the researchers lack easy access to records of previous and contemporaneous research. It also recognizes that lack of intelligent technical abstracting and interpretation of textile researches is as effectual a barrier to their possible adaptation and application in the art by non-

technical men as though their publication were prohibited. That is one of the chief reasons why so little of practical value has resulted from the numerous important researches of the British and other foreign textile research associations. The demand for research information thus interpreted and made available will not be limited by the number of research men in laboratories in the industry, but by the number of persons desirous of knowing the why and how of things textile.

The book part of the Council's library plan will necessarily be of slow growth, but duplicate indices, bibliography and abstracts of textile research in this and foreign countries will be collated as rapidly as possible. These will be made available to members on application in the form desired, and the records will be available for personal study. New textile research work and allied published information will be indexed and abstracted by specialists, and, in addition to a service similar to that of Chemical Abstracts, it is possible that regular publication of records and abstracts of the more important current researches may be made a feature of some of the trade press. The most valuable part of the service to research men, however, would be frequent mimeographed reports on the subjects in which they are interested, and the preparation of bibliography, abstracts or photostat copies of research information available.

Last fall, when we looked for the best man in the country to give us an expert opinion on the value and organization of a textile research information source, we were advised by so eminent a research authority as Arthur D. Little, of Cambridge, that he is W. P. Cutter, at present assistant librarian of the Baker Library of the Harvard University Business School, and the organizer of several important research and technical libraries, of which those of the Arthur D. Little Laboratories, Cambridge, Mass., and of the National Aniline & Chemical Company may be mentioned. Mr. Cutter in his address spoke to us in part as follows:

"We must realize that further progress in the textile industries must be based largely on new discoveries in pure and applied science. The knowledge already acquired is scattered, and not so analyzed and indexed as to be available to all.

"I cannot conceive how any such enlarged plan for research can be developed unless it is based on a knowledge of the present condition of the industry. The first step is to find out what has already been accomplished, and this can only be determined by an intensive study of the records.

"In general, the best plan is to make the literature study before embarking on any laboratory research program. And it would seem to me that from the beginning the Textile Research Council should plan for literature research, both in the way of making a current digest of textile literature and in preparing an information service which would be of assistance to laboratory research workers."

This is necessarily an incomplete résumé of the service to be performed by this proposed central source of research information, but it should suffice to demonstrate that there can be no successful research program that is not based upon this foundation, and that, while such a program is being organized, or entirely independent of a co-operative research plan, it can be made an important service to the industry.

Incorporating Under New York Laws

The Textile Research Council is incorporating under New York laws to provide added responsibility for its expanded activities, has authorized the collection through sustaining memberships of a fund for promoting the library plan, and is working on new by-laws to be presented for adoption at its spring meeting in April. New York was decided upon as the State of incorporation and New York City for the office of the corporation in the belief that the latter would be most accessible to future centers of textile research activities, to technical libraries and institutions, as well as being most centrally located for a majority of the industry; the fact that its cosmopolitan character renders it non-sectional was also a factor that weighed in its favor, for a co-operative research program must serve textile mills wherever located, and sectional and other jealousies must not be allowed to endanger its success.

Incorporation is pursuant to Section 12 of the New York Membership Corporation Law, and accords the organization the broad powers and responsibilities that must be assumed if a broad plan of systematic, co-operative scientific research is ever to be undertaken by the industry. The Textile Research Council retains its present title with the addition of "Inc."; this, and the service of present members of the executive committee as incorporators and as directors until the next meeting, being recommended by our attorneys to facilitate and simplify procedure.

The New By-Laws

Although a large amount of conscientious effort has already been given to the drafting by our executive committee of a new set of by-laws, there are several important sections upon which our opinions differ that are open for further discussion, and, even after unanimous approval by the executive committee, it will

have to be considered tentative until after we have had the advantage of careful consideration by the officers or special committees of the industry's leading associations, to whom it will be submitted for constructive analysis and criticism. I am pleased to state that among those who already have volunteered to co-operate in this connection is the American Association of Textile Chemists and Colorists through Dr. Killheffer.

Because of the tentative nature of the by-laws at present I shall merely present an outline of their basic features; these may be conveniently classified as executive, administrative and financial. The executive organization has been planned with the idea of giving representation to every major branch of the textile industry, but the proportion of such representation remains to be worked out. There will be a president, six vice-presidents, a treasurer and a secretary. The board of directors is scheduled at present for twenty-four members, but may be increased to thirty if it is decided to make the board of trustees self-perpetuating. There are two standing or permanent committees of six members each—the executive committee and the board of trustees. The president is ex-officio member of the board of directors and the executive committee, and has general supervision of the corporation's administrative affairs, but the active carrying out of the latter devolve upon the secretary, subject to the orders of the president, the directors and the executive committee. The powers and duties of the directors and executive committee are those that are normal in organizations of this character, flexibility of management being assured by the fact that the comparatively small executive committee has authority to exercise all of the powers of the board of directors when the latter is not in session.

A provision of the by-laws that will be highly important during the organization's first few years, and that should tend to insure continuity of purpose, is that which provides for the election of vice-presidents, directors, executive committee and board of trustees in three classes, each consisting of one-third the total number and each class elected after the first year for terms of three years each. Therefore, after the second year all classes will serve for three years and one class will be elected each year. This gives the organization the benefit of a constant succession of the industry's talent and of maintaining interest in its work through active participation, and at the same time gives reasonable security from frequent change of policy.

Provision for financing of the organization is through various classes of membership which as yet are not definitely determined, and also through gifts, bequests, etc. The funds will be divided into current and permanent, the former accruing only from dues and the latter from dues, gifts, bequests, etc. The current funds will be held and administered by the board of directors, together with income of any permanent funds that may become available, but the custody and management of the permanent funds will be vested solely in the board of trustees. The idea that we have in mind is the creation of a permanent foundation fund for scientific research managed by a self-perpetuating board of trustees that will command general confidence and respect, and that will commend itself to those who have profited by their connection with the textile industry, and who would welcome the opportunity to endow such worthy purpose by gift or bequest, or utilize it to perpetuate a named memorial. The foundation, or permanent, fund, however, will not await bequests and devises, but, as previously stated, will be built up by dues of certain classes of membership, by gifts and other current means.

The Textile Alliance Fund

The scientific research foundation to be administered by the board of trustees should attract to that body men of the highest standing and integrity in the industry, and when thus organized should become the logical recipient of the largest sums that may become available for such a beneficent purpose. When thus organized it would have within itself practically all of the essential provisions and safeguards of the Merritt bill that was drafted nearly two years ago to make available to the textile industry by Congressional action for scientific and economic research the Textile Alliance fund of more than $1,300,000. The only noteworthy exceptions are that economic research is not specifically provided for by the Textile Research Council's foundation, and that the trustees are not subject to appointment by the President of the United States and will not necessarily have three members who must be specified Government officials. The eventual availability of the Council's board of trustees to handle the Textile Alliance Foundation fund will be made known to the responsible parties in due course, and it is possible that this may be the means of removing the Merritt bill from the table of the House Committee on Interstate and Foreign Commerce, if it still reposes there, and pave the way for new legislation that may make available for scientific textile research a major part of this large and much needed fund.

In Conclusion

Now, you will appreciate that what I have said covers merely a proposed approach to scientific textile

research, merely the outline of an organization and its financing and administration. I have purposely refrained from attempting to pose as an evangelist trying to convince you of the need of such research, for that would be carrying coals to Newcastle. There is no other single group than yours in the textile industry which realizes that need more fully in their everyday work, and there is no other organization that has given more time and study to research methods or has had more experience along those lines, and it is my hope that one result at least of my story of what we are trying to do will be some arrangement by which our organization may confer with representatives of yours on the whole subject. We hold no illusions as to the difficulty of selling even our modest library plan to the industry under present business conditions, but we are as eager to start something toward the research goal as are your officials and your research committee, and that much of a start we are determined to try.

The "prep" school I attended was a Methodist institution and revivals were frequent and productive. Several Japanese boys were students there, and one of them, a most lovable and serious youth, having been subjected to much prayerful effort, became converted; at least, he testified that he had become convinced that Christian religion was better than Japanese religion, but that if in the future he found a better religion he would try that also.

I believe that I reflect accurately the views of a majority of our members when I state that if we are convinced that someone has a better plan of attaining scientific textile research, or even one that may not be so good, in our opinion, but that will be easier to sell to the industry, then you can be assured that we will give up our present plan and become converts to the new.

I believe I also reflect accurately the feelings of our members when I state that if there is any organization or group of organizations in the textile industry that has the ability to sell scientific research to the industry, and desires to utilize our plan wholly or in part, they can have it lock, stock and barrel, gratis.

Discussion

Chairman Kingsbury—If anyone has any questions, I think Mr. Clark will be glad to answer them.

Mr. Wood—Mr. Chairman, I haven't any particular question I would like to ask because I think Mr. Clark has given us a very clear and lucid outline of the aims and objects of the Textile Research Council. It is a very ambitious program, but I don't think it is at all unreasonable. The main difficulty seems to be a financial difficulty. The plan as outlined to us is entirely practical and it is within the bounds of reason, and I think there is an urgent call for such a plan to be put into almost immemediate operation. I say almost immediate operation because the financial requirements are so large; but when we think again of that statement, probably the financial requirements are not so large considering the wealth of the industry. That may make some of us smile, because the industry seems to be rather depressed at the present time.

Senator Moses applied a name to certain Senators that would equally apply to a great many textile manufacturers. (Laughter.) They don't know what is best for their own good. There seems to be a wild scramble to get down well below cost, instead of a scramble to undertake some work of this nature which would improve the industry and make it possible to do something better than we ever did before, and I say that first, advisedly and properly, and, this is only secondary, *cheaper* than we ever did it before. Personally, I don't see the necessity for doing things cheaper. I can only see a necessity for doing them better, and this is a step in the right direction.

I might put this almost in the form of a question. I will put it in the form of a statement, Mr. Clark. I presume that the feeling of the Textile Research Council is that they would act as a sort of clearing house for research work which would be undertaken in the textile field. Such an organization is very necessary. A great many of us here to-night are doing a certain amount of research work in a modest way, but we are all working independently. We are not relating our work to that of anybody else with the idea of helping one another forward and that is rather a regrettable thing, that so much energy should be expended, I won't say uselessly, but in not quite as useful a manner as it could be if we were to try to relate these different pieces of work that are being undertaken all over the country and make them one harmonious whole, and use the work that other people have done as a ground work for other work that we want to undertake, and that would be entirely possible if all these researches were reported to a central bureau such as the Textile Research Council and made available to other people working along the same lines.

There is an exact parallel in the relation of the National Tuberculosis League to the research workers in medical science throughout our country. In fact, they go even further than that. They lay out a research program which is carried out in different laboratories and different hospitals all over the county, and it is surprising what an immense amount of work has been done since the work was organized. We would feel the immediate benefit of any such direction from headquarters, so to speak.

As regards the financial side of the question, that is quite a little more difficult. A great many years ago when I first went into business I remember there were very

few chemists in the textile industry at all. At the plant I happened to be engaged by—my first job—they never had had a chemist. In fact, I don't know that they knew what the word meant because I remember after I had been there some time one of the members of the firm suggested that I needed an assistant and he suggested a soda clerk. He thought he must know something about drugs. (Laughter.)

The state of mind still exists in a great many instances in the textile industry. Of course, I know the dyeing and printing industry much better than I know the manufacturing, but I imagine it does exist throughout the entire industry. Mr. Clark knows it probably a great deal better than I do.

They are in somewhat the same state of mind as the old man who sent his son to college. The son came back and the old man took him into the mill. The son decided to revolutionize the entire business. The old man wasn't running in right any way. They never do. So the son came in with a great deal of enthusiasm and said, "Now, Dad, we are going to change things all over."

The old man replied, "Well, I have been running this for about forty or fifty years. What are you going to do?"

"Well," said the son, "the first thing to do is to get some statistics."

"What are statistics?"

"It is like this: They have estimated if all the saxophones in the United States were melted up and made into one big saxophone, it would be as big as the Woolworth Building."

"I wish to hell they would do it, then nobody could blow it." (Laughter.)

I don't know but what I think he is right.

The selling of this proposition to manufacturers, and dyers and printers, is going to be rather hard, and I think it has to be approached as all these questions have to be approached, from the business point of view. It would seem that possibly the best way would be to engage a salesman with a knowledge of our profession, a supersalesman, if he can be found, if one does exist among the chemists, who could go out and explain this thing to the manufacturers who are able to provide the wherewithal to carry on this great work, but before he can do that, he must be taught what the program is.

And, what is the program? Who knows? That probably is the main questions before all of us, to lay out a program both for the benefit of those who are going to undertake the research, and for the benefit of the man or men who are going to sell this proposition to the manufacturers.

It would be a pity if we were to present this inadequately, so that it wouldn't enlist the support of the manufacturers. I think, Mr. Clark, that the problem has to occupy the minds of the Council more than the purely mechanical matter of getting in the funds.

With a proper program, you can, so to speak, elect your candidate. Without a program, you can't sell the thing to anybody. The main part of the work is to get together all these other associations with whom you hope to affiliate yourselves—I think I might say *we* hope to affiliate ourselves because I think I am also a member of the council. I think these meetings should be inaugurated as soon as possible, and a real program laid out, and I assure you that is almost a superhuman task, because in our own association (I don't know how many members of the Research Committee are here), we have found a great deal of difficulty in really making up our minds what we are going to do.

It is something like the Ladies' Aid Society at our church. My wife went down there for a while when we first joined that church and she asked, "What do you do at these meetings?"

They said, "Well, we sit around and talk about what we are going to do."

I think that is probably the way with a great many associations. They are always going to do something but they don't get to it.

This seems to be the first logical movement toward a co-ordination of these sporadic efforts of various associations to do something, and we should not lose sight of it. We should take advantage of it and strike while the iron is hot, get our different associations to work, and work with them, to put the thing over. (Applause.)

Mr. Clark—Mr. Chairman, that matter of a specific program is one that of course we have necessarily given some thought to, but it has been our idea that this library and source of information would be a long step toward the laying out of that program. As a result of that work and surveys that would be made with your committee, they would gradually build up the approach of the program. The program can't be constructed offhand. It seems to us that it is necessarily a matter of comparatively slow growth, although there are any quantity of research subjects that could be undertaken right off the bat, not necessarily with the establishment of our own laboratory, but by taking advantage of existing laboratories, and scientists who specialize on certain classes of work. Of course, it makes a difference whether we are considering pure research or developmental work. If it were developmental work, that is something it seems to me we have got to have a laboratory ourselves for, or we shall have to depend upon individual manufacturers, or the machinery and supply people, rather than undertaking it ourselves. But that is the great big problem that we have got to face sooner or later.

A. P. Howes—Mr. Chairman, I would like to ask Mr. Clark if any progress has been made with other textile associations. Have you people come into close contact with any other existing associations?

Mr. Clark—There is one, Mr. Hobbs, president of the National Association of Wool Manufacturers, is on our Executive Committee, and he assured us that a committee would be applied to consider the indorsement of his association for our plan. And when I say *our* plan, I hope that plan is something upon which the American Association of Textile Chemists and Colorists can co-operate with us.

We have no pride in this work, pride of authorship. It is merely a suggestion, and we hope that some part of it at least will be of value to the industry as a whole and will meet the approval of other organizations. And there is no other organization that I know of, excepting yours, that is working along similar lines.

Mr. Howes—How many associations are there in existence to-day which ought to have some interest in the establishment of a central research bureau?

Mr. Clark—My answer to that question is that we have the national associations of each major branch of the industry in mind.

Mr. Howes—We think of some readily, the Silk Association, and the Cotton Textile Institute and others.

Mr. Clark—Yes, and the National Association of Cotton Manufacturers, National Association of Wool Manufacturers, American Cotton Manufacturers' Association, Knit Goods, Carpet and Upholstery and Finishers' Associations, the new Rayon and Synthetic Fibers Institute, which is hardly going yet (the rayon people have got to be taken in and their support must be had) and your association.

Mr. Howes—My question was prompted by the feeling that the more associations you could get behind the thing, that is, as far as name goes, the easier it would be to put it across. I think if a careful study were made of all the already organized associations, which might have a possible stake in this direction, you would find the number is far greater than you have any idea of. And it seems to me the way to get somewhere quickest is to get one accredited representative or two or three, the smaller the number the better, from each one of these associations and get them together under a common roof where they can all really agree to put their shoulders to the wheel and try to start something going. It might be necessary to scrap all existing organizations and start up with something new, so that nobody should have the credit of doing it, if for no other reason. I believe that is the way to do it, myself.

Mr. Clark—I agree with you.

Mr. Howes—Even if you couldn't get appropriations directly from the associations, if you could get the unanimous indorsement of all, and go to the larger textile institutions and say, "Here is a movement for the good of the textile industry of America, which has been investigated and sponsored by so-and-so and so-and-so," citing all the textile and allied associations as indorsers, you would have a much better chance of getting something. We think the American Association of Textile Chemists and Colorists has done at least as much as anybody up to date, but it is an awfully hard job getting any real money for an individual outfit.

Mr. Clark—My greatest fear of approaching the associations for funds as association contributors is that it provides a very easy alibi for such members of associations, who would be later approached to make individual contributions, saying, "Our association has already contributed. You can't expect us to." That is one reason why we have sidestepped that appproach.

Mr. Howes—Let them all indorse it then. Let us go in as the Association of Associations or something like that, not as any one association trying to get money for a specific branch of the industry, but try to get unanimous indorsement from every organization that has any official standing.

Chairman Kingsbury—Has anyone anything else to offer?

I think the Chairman of our Program Committee, Mr. Herrmann, has an interesting announcement for us.

Mr. Herrmann—In addition to the speakers already arranged for, the following will be included on the roster this spring: March 28: Howard C. Bishop, "The Use of Salts of Hydrofluoric Acid in Textiles." April 25: Prof. Sheldon, New York University, "The Broadcasting of Colors."

Chairman Kingsbury—Well, gentlemen, a motion to adjourn is in order.

. . . It was moved, seconded and carried that the meeting adjourn.

. . . The meeting adjourned at nine-twenty o'clock.

JANUARY MEETING OF RHODE ISLAND SECTION

THE January meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held on Friday evening, January 31, 1930, in the rooms of the Providence Engineering Society.

The following officers were re-elected for the year 1930: Richard B. Earle, Chairman; A. Newton Graves, Secretary; Ben Verity, Treasurer.

Sectional Committee—John G. Masson, Carl R. Moore, Morrell Mackenzie, Herbert F. Schwartz.

The Nominating Committee consisted of the following: John Hutton, Alfred L. Lustig, A. N. Dana.

Dr. Earl K. Strachen, of Brown University, gave a very interesting talk, entitled "Some Facts About Colloids."

Thirty-four members were present.

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This action of the Democrats is one of the most heartening senatorial developments which has come to our attention in some time. It would seem to prove that there are such things as common sense and ordinary patriotism still to be found in that august body upon occasion, and that once in a while political expediency can be sacrificed for the sake of what is obviously the national welfare.

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dollar to buy outright production plants in foreign countries?

America learns most quickly by experimenting. Even now several large concerns have taken initial steps in this direction. What the general policy of the country may be in the future we hesitate to predict.

But, even now, cries of approval and disapproval arise from all sides. Out of the crowd an extremely loud voice calls. He demands that we look to our own country first. We should encourage foreigners to do the same to us? We should welcome comparable foreign expansion within our country at the expense of native industry? We should not build up our home production to a maximum in the dyestuff field before going abroad?

Random Thoughts on Research

[EDITOR'S NOTE—*This is the beginning of a series of articles entitled "Random Thoughts on Research," which will run through several editions of the Reporter. The author has devoted much thought to this particular subject but prefers to have his name withheld. We trust that these editorials will serve an educational purpose and provide a basis for further thought and discussion in regard to research work. We shall be pleased to publish any comments and replies that these editorials may suggest to our readers.*]

APOLOGIA—This is the first of a more or less connected series of thoughts on research inspired by the voluminous recent discussions on this very important subject and tempered by first-hand experience with research on textile problems.

The writer favors some sort of organized research in textiles, although he may at times appear to argue to the contrary. These arguments are mere groupings in search of a suitable program and of ways and means of putting it into effect.

It is fully realized that a bigger thing is contemplated than may appear under discussion in some of these articles, but some of the narrower points of view will keep cropping up and must be met by suitable arguments and reasons.

The points advanced are not all necessarily new, nor is there any attempt at a complete treatment of the subject. Perhaps some of the more unconventional ideas will help start some useful discussions.

I—UNPLEASANT BUT VITAL QUESTIONS

Why spend money for research? Of course, we know that it is a great thing and all that; but why should a cotton manufacturer, for example, spend his good money for it? His mill is running right along, perhaps doing some night work, so what more can he ask? He may or may not be making much money, but why should he spend part of it for the indefinite entity, research?

On the other hand, the mill may not be running at all and may be on the verge of failure. Will a broad research program for the industry in general help it pull through, and just how? Or is research better for the mill that is up and down, now doing well and now not so well?

This is the first of a series of short articles that are intended to start some thought about some of the features of textile research that are of practical importance, perhaps of extreme importance, but which do not seem to get into the average discussion of the subject. To avoid any misunderstanding, let it be said again that the writer is in favor of a broad research program as being of value to all directly concerned in the textile industry, and to everybody else, because we all use textiles.

If research is really as good as we think it is, it surely should not be difficult to put across. But, it is difficult. If we still have faith in the research, then the fault must be in our presentation of its claims. Perhaps we are not good salesmen; for, you know, salesmen are supposed to sell anything, even including big ideas.

Assume, then, that a research program is desirable and that we desire to help promote it. Any mill owners who are particular about where they spend their money—mention some who are not!—will ask just such pointed questions, and between them they will ask many of them. If research is good there must be a definite answer to each such question that will remove any implied objection. *There* is a job for salesman, missionary and anyone else who can help the cause.

The writer does not profess to be able to give all the answers, but, at the expense of perhaps being mistaken for the "opposition," he will try to present some of the objections that may be raised. Since a little preliminary agreement on a subject is apt to help the clarity of an argument, let us, before we get in deeper, specify a little more about textile research, for there is more than one kind. There is a broad field which we might call the science of textiles, wherein are to be found the inner secrets of the fibers: why they are strong; why they attract dyes; why they are plastic and will take a finish; what is the chemical formula of cellulose, the composition of silk, and so on. Yes, this is the theoretical stuff that is so frequently passed over in the journals because it is not practical.

In spite of an affected disdain by many technical men, the real live individual chemist or mill research man delights to delve in such subjects; but he cannot get far enough to find much practical everyday use for them, for the information now available is not definite enough for him to use. He wants to see this frontier of knowledge pushed on until we can say just why cotton is soft and other yarn wiry, and a thousand other things. Then he can perhaps show how to im-

prove a finish or devise a better one. This is the research that we need.

Meanwhile, until such information is available, research will concern itself with the more everyday problems.

I suppose that, to be a salesman, you must sell (to) yourself first. Therefore, to sell research think up the questions that you would ak if you were running a mill at a moderate profit and someone asked you to contribute a thousand dollars a year to research in textiles; then think up the answer that would draw the thousand.

Prompt Action in Mill Accidents

(*Continued from page* 114)

be strictly adhered to. Rules should apply to danger spots, and a breech of them should be punished as severely as possible, short of the chair.

In order to round off the safety instructions it is well to give also some brief instructions in the best ways to deal with such accidents as must inevitably occur from time to time. Mills that run a definite hospital department, for both day and night shifts, will naturally have their own methods of handling such cases; but in smaller places not so prepared, especially those in which the "first-aid" room does not function at night, the following short notes will probably prove useful, as they have in very many instances in the past:

Small cuts and wounds not requiring medical attention are washed in clean, cold water; then covered with boric lint and bandaged with slight pressure to stop the bleeding. A solution of iodine may be brushed over the injured part to stop infection. The old-fashioned remedy known as Friar's Balsam is good if applied freely to a cut that is bleeding rather badly. The still older practice of putting spider's web on should be avoided. Webs only occur where there is dirt, and dirt must be kept away from wounds. In cases of *much bleeding,* after bandaging, the injured part should be raised above the heart level until the flow of blood has ceased. It may be necessary to apply a pad to the wound to check the flow; if a vein be cut, tie a tourniquet around the limb on the side away from the heart; for an artery put the tight band on the heart side of the wound. In severe cases do not hesitate to send for a doctor, and if there is any doubt as to its being bad enough, let the doctor know.

Scalds from steam, boiling water and *burns* arising from dry heat can be very dangerous. The clothing must be removed with great care, cutting it away if necessary, but if it should have stuck to the flesh do not pull it off; let it remain and soak it in oil. Carron oil is the mainstay of the anti-burn campaign; it is made by mixing equal parts of lime water and castor oil. A bottle should always be kept handy not only in the dyehouse and mill but in every home also. The great thing in curing burns is to keep the air away and not let any moisture get to them. Blisters must be left unbroken as long as possible; they retain the water which might otherwise do damage. The whole of the injured surface is soaked with a plentiful supply of the oil, or if it is not available, pieces of bandage well smeared with boric ointment or cold cream should be laid on. The whole of the part is then coated with a thick layer of cotton wool and a light bandage put on to hold it all together. This should be redressed twice daily. A saturated solution of picric acid in water may be lightly smeared on a *slight burn* to alleviate the pain.

Burns from corrosive acids are very apt to occur in the dyehouse; they call for great care and judgment. The part should be washed at once in copious and gentle streams of water. Small amounts of water may cause far greater injury; water under high pressure has been known to wash away the burnt flesh. We had a man die in one factory because of the misguided application of a hose to the poor fellow. Plenty of water poured gently on it what is wanted. Then a solution containing about 5% of sodium bicarbonate should be washed on to "kill" the remaining acid. After that the place is dabbed dry with cotton wool and treated with oil as for ordinary burns.

The *burns* that arise from *caustic alkali,* as in mercerizing, should be attended to in the same way except that instead of neutralizing the last traces with soda, in this case a dilute solution of acetic acid will be needed.

Never rub a *bruise.* Let cold water flow on it for a time and then bind it up lightly with a pad soaked in witch-hazel or tincture of arnica; the latter only when the skin is unbroken.

Electric shocks are not very prevalent in the days of advanced knowledge in fitting up the installation. When such a thing does happen, the main should be switched off at once and the person pulled out of contact. The man who does this should be at some pains to insulate himself first, using dry material for the purpose; silk, cotton, wool and paper may be used or a rubber tobacco pouch slipped over the hand. The clothing of the torso must be unfastened and the patient aroused by slapping the face and chest with the end of wet cloth. It may be necessary to proceed with artificial respiration.

Acid or alkali in the *eyes* should be bathed with either the soda solution or with boric acid solution, respectively; then, having dabbed the eye with wool to dry it, a few drops of castor or olive oil will relieve the pain. *Specks of solid matter* call for the oil treatment; the foreign material may often be brushed out with the corner of clean rag twisted up, or better with a small camel hair brush, slightly moistened. In case of splinters of glass, the patient should be hurried off to the doctor.

A *crushed foot or hand* should have the boot or glove removed by cutting it away; then a thickly padded splint is placed on the sole of the foot or to the palm and wrist

and held there by a figure of eight bandage. The limb is secured in an immovable position while the injured person is carried to the hospital.

A lookout should be kept for *shock* arising from injuries. This is seen by the extreme pallor, a cold clamminess of the skin, the pulse fading away, gasping breath, gaping and sighing; at the same time the temperature of the body begins to fall; this condition is very dangerous. As soon as the causative damage has been looked after, the clothing should be undone and the head laid lower than the feet while smelling salts or sal volatile is applied. The patient must be kept warm with rugs or coats, better with heated bricks or hot water cans. These will be constantly renewed, as it is very bad to have signs of an improvement and then find the symptoms return again. Here again it may be necessary to resort to artificial respiration.

Forcing liquids down the throat of an unconscious person may choke him; smelling salts or snuff applied to the nose will usually start him breathing again; then rub his limbs toward the heart; do this vigorously to aid the sluggish circulation. As soon as the person shows signs of being able to take it, hot coffee, tea or meat extract should be given.

It will be noted that the details are all simple and easily memorized; the medicaments required are not beyond the use of the least skilled persons, but the treatment is efficacious.

The safety rules of every textile mill require formulation suitable to its own needs; the general outlines here given can be quickly altered to fit. These rules are everybody's business; that is a point that should be well emphasized. It is no manner of use for a person seeing an infringement of the factory safety regulations to shrug his shoulders and pass by on the other side with the mental comment that there would be the devil to pay if the boss saw it. The lives or limbs of men and women depend upon the observation of the safety rules, and the organization should lose no opportunity of driving this fact well home.

General Dyestuff Corporation announces two new Indigosols, the Indigosol Scarlet 1B and Indigosol Brown 1RRD. Both products are recommended for dyeing and printing. They claim excellent fastness to light which places both into the class of the Indanthrenes.

They also announce the production of Ind. Brilliant Pink RA by the General Aniline Works. This color corresponds to the well-known imported Ind. Brilliant Pink R, but is a trifle brighter and shows better fixation in printing than the foreign brand, it is stated.

On account of the present increasing vogue for pastel shades, two interesting color cards have been issued by the Surpass Chemical Company, Inc., Albany, N. Y.

Laboratory Washing Machine Used in Poland (The Pralka)

For Determining Fastness of Dyeings to Washing, Water, Acids, Alkalies and Perspiration (Pat. Appl. For)

[EDITORIAL NOTE—*The following description of a laboratory washing machine was recently received from Poland. It reports to have met with the approval of the Polish Fastness Commission (P. K. N.) and will undoubtedly interest some of our members.*

It was necessary to extensively edit the description as received, but an effort has been made to retain as accurately as possible all of the details of the original.

One of the drawbacks of this apparatus, as compared with the Launderometer, for instance, is that only one sample can be run at a time, whereas in the latter any number up to twenty may be run simultaneously.

L. A. O.

THIS apparatus has proved to be extremely convenient and has given accurate results. On experimental trial the apparatus shows, on the washed and untouched places, differences easily observed.

At the meeting of a sub-committee to test the fastness of dyeings, the P. K. N., Pralka was very flatteringly received. The apparatus is entirely constructed in Poland.

Description—The essential part of the apparatus consists of a double ring in two parts accurately fitted to each other, 8 cm. on the outside and 5 cm. inside diameter. This ring has a perpendicular movement with a turn of 10 cm. and a rate of 60 turns in a minute. The ring with the sample moves in an experimental bath, and, at the highest position of the turn, rises a little above the surface of the liquid. In order to keep the temperature of the experimental bath to the proper level, the vessel is put in a steam bath which is heated either with a Bunsen burner or by an electric heater or any other convenient means. The vessel is covered with an easily opened cover, which prevents the escape of too much foam and its squirting on all sides. The whole apparatus is solidly nickeled, and the vessel for the experimental bath as well as the rings are made of nickel plate, due to which the experiments can be made under the influence of weak acids. The apparatus is of a very light, but absolutely solid construction. Its weight is 60 kg., height 110 cm., and base 60 x 60 cm.

Test.—In order to perform the test one cuts by means of the model which is added to the apparatus, round pieces of the trial fabric and some pieces of white cotton web, also a woolen one, fixing them closely with thumb nuts into the ring, arranging the trial colored sample between the white samples. Loose fiber and yarn are tested in the same manner and such samples are pressed between the two round pieces of the white fabric. The testing liquor is poured direct into the vessel. A normal bath contains one liter of fluid, the amount being indicated by the key

on the horizontal tube. When it has been brought to the proper temperature, by means of an easily disjointed coupling the ring with the sample is fastened to the operating parts of the apparatus, and then the protecting cover is pushed in front, the motor is attached and the apparatus works automatically. It is necessary only to control the temperature of the bath during the testing. After the experiment is completed, one opens the cover and the ring is easily taken off, the samples are taken out, thoroughly rinsed, dried at a low temperature and preserved as a record. The pouring out of the bath is done through a special cock. The fluid is poured into the hot water bath through the tube of the leveling device.

Results—The accurate working of the washer and the fully regulated mechanical parts of the process permits one to state quite accurately the fastness of the dye. Accuracy of the washer requires that distilled water be used in making up the testing solution, because differences in the water, whether it is hard or soft, may have an influence on the results obtained. An exact and detailed classification of the fastness of dyes within a reasonable number of groups may be obtained. The washer is so accurate that in dyeings i. e., with Benzopurpine, one is able to find on the pressed parts of the sample the degrees of running of the color. It is likewise possible to register the changes of shades under the influence of the reagent.

The result of the examination is not obtained by virtue of the dyeing itself becoming weaker, but by the dyeing of the white fabric, which is held in control with the sample being washed. It proved convenient to indicate the grade of fastness according to the first signs of coloration of the white fabric. Due to the arrangement of washing the sample by immersion and removal, one succeeds in catching the first signs of coloring at the top of the stroke. Due to the impossibility of the dissolved dye spreading beyond the ring because of the complete stop to the flow of the liquid in these places, the white fabric gets dyed in the shape of a circle. A further control consists of the color of the soap bath.

With such indications, erroneous comparison with other dyeings is removed. For example, we give the average fastness of dyeings on cotton to washing, such as has been proposed to the sub-committee for standardization of color fastness of the P. K. N.

Reagents: distilled water, neutral Marseilles soap, soda and soda oil, 38° Bé.:

Class 1—Distilled water, 15° C., 15 minutes.

Class 2—Distilled water, 15° C., 60 minutes.

Class 3—Distilled water plus 2.5% soap, 15° C., 60 minutes.

Class 4—Distilled water plus 2.5% soap plus 2% soda, 15° C., 60 minutes.

Class 5—Distilled water plus 2.5% soap, 30° C., 15 minutes.

Class 6—Distilled water plus 2.5% soap, 45° C., 15 minutes.

Class 7—Distilled water plus 2.5% soap plus 3% soda, 60° C., 30 minutes.

Class 8—Distilled water plus 2.5% soap plus 1% soda oil, 95 to 100° C., 30 minutes.

The fastness of the dye is placed in the highest class, in which the white samples washed together with the dyeing remain quite uncolored or unstained. When given the proper grade of washing the dyeing when examined in the marked places, has an almost imperceptible tone of dye. One must distinctly see the demarcation on the sample between the color of the washed place and the original color, which remained in the shape of a circle.

With similar precision in the same apparatus, examinations as to the fastness of dyes in water, perspiration, acids and alkalies can be performed.

This apparatus is made by the Technika Gorzelnicza Company, Warsaw, Poland.

Color as a Factor in Patentable Design

By Waldon Fawcett

ONE of the most surprising, or, at any rate, one of the least expected, results of the current surge of color in industry has been a reversion to the United States patent system as a means of protecting originality in ornamental design. Producers in various lines, newly awakened to the possibilities of color as a transforming agent in manufacture and glorying the while in new miracles of color or color combination, have conceived the idea that these new triumphs in color might provide an escape from the bugbear of "invention" which has so long set severe limits upon design protection.

It is just possible that this recourse to color as a forlorn hope of patent qualification would not have been so marked had the color era not been coincident with the stalemate in Congress on design registration. In the years immediately following the war confidence was high in industrial circles that only the time necessary to reconcile conflicting ideas was needed to win for American industry a revolution that would take design certification from the precincts of the patent system and place it under the copyright system, thereby making grants of design rights contingent upon authorship instead of upon invention. Inaction in successive Congresses has sapped this hope of relief.

With steadily mounting appreciation in American industry of the style element, with which design is so intimately bound, it was inevitable that there should be a reaction to the design patent system, with the solace that half a loaf is better than none; especially since hope springs eternal of means to circumvent the severe technical requirements. For it may as well be confessed that, in the eyes of most business men, the chief fault of the design patent system is neither the

expense to the patent applicant nor yet the deliberate or time-consuming procedure so disastrous to a seasonal design. More fatal than either of these is the exaction of inventiveness in the design. If color, in its new conceptions, could circumvent this demand for an originality amounting to sheer genius, then blessed indeed would be the name of color.

The freshly inspired effort to predicate a demand for design protection upon ingenuity in the application of color has already resulted in several test cases which indicate, in some degree, what will be the attitude of the Federal tribunals with respect to this premise. Especially interesting was the case of Benjamin F. Miller vs. Max Swartz, recently decided in the U. S. District Court for the Eastern District of Pennsylvania. Interesting, that is to say, because it involved, incidentally, the question whether a patentable new effect in a woven fabric may be obtained by dyeing or alternative methods.

Essentially the objective in this case was the establishment, via patent, of a monopoly in the right to produce a fabric of a so-called mottled appearance. The patent application stated that the older methods in use to produce this mottled effect were "by twisting strands of different colors" or by "dyeing" the fabric. The patentee undertook to produce the same effect by a combination of weave with threads of different colors. It was asserted that this produced the desired effect more economically and improved the quality of the fabric. That claim was rejected at the U. S. Patent Office on the ground that the method was known to the art.

With the broad principle thus challenged, the argument was advanced that even with the whole field of possible combinations open to designers, if one fell upon a particular combination the benefit of which the trade had not before had, and which was of real value, the discoverer might well be thought to have invented something in the patentable sense because possessing novelty and utility. The opposing logic was that such a patentee would have done no more than other designers are every day doing, which is to try different combinations until an acceptable make of fabric results, and that if a patent be given upon a particular combination patents must likewise be granted for other particular combinations, the result of which would play havoc with the trade.

The Federal judge was unable to find warrant for a patent for the mottled effect, however produced. He ruled that no patent should issue for a fabric having a mottled appearance, because fabrics of this appearance are admittedly "possessions of the art." Nor would he accept the doctrine that the specific kind of mottle involved in the design in question was produced not by the use of twisted thread or by dyeing but by a combination of threads grouped in a given color relation in warp and woof, and woven in a given way. In effect, the court declared that even if there were produced by a different method a mottle heretofore attained only by dyeing, this would not support a patent so long as there was no contrast in appearance and only an expert could recognize a difference, and then only by picking apart the threads.

In the early days of the administration of the design patent system the Commissioner of Patents remarked on one occasion that he was not prepared to say that no design might be based on color. In practice, however, scant recognition has been given to color as such. Thus it has been held that just as the material upon which a design finds expression confers no virtue upon the design, so is color merely a vehicle. Expressing this view, as chief referee, a Commissioner of Patents once said: "A combination of red and blue and green may be beautiful and the effect very desirable, but it forms no part of the design, but is the medium through which the design, which relates solely to form and configuration, finds expression or materializes."

Change in color has, traditionally, been held insufficient to command patent protection for an ornamental design. The dictum on this is that mere substitution of one color for another possesses no element of originality and indicates no exercise of genius, and cannot, therefore, become the subject of a patent. By like reasoning there is no sympathy, on the part of United States examiners, for any blending or arrangement of colors unless a new esthetical effect is produced or an original idea indicated. The doctrine tenaciously held by the administrators of the patent system is that colors applied to a design do not affect the essential characteristics. "Color forms no part of a design," was the avowel on one occasion, and no less downright was the official warning of Federal authority that "color constitutes no element of a design patent." The most recent object lesson on the difficulties of color segregation seems to hint that it might be more readily possible for an inventor to obtain a process patent covering a new method of producing a color effect in industry than to secure a design patent covering the color as translated into the finished product.

M. F. Corin, who for fourteen years has been Philadelphia district sales manager for the Permutit Company, manufacturers of water-treating equipment, has been appointed general sales manager.

He will have supervision over nineteen branch sales offices throughout the United States, and numerous sales agencies in foreign countries. He will assume his new duties at the Permutit Company's main office in New York some time during February.

The Calco Chemical Company, Inc., has announced recently that it has acquired the plant and good-will of the Beaver Chemical Corporation, of Damascus, Va., and will continue the production of sulphur colors and alizarines in which they have always specialized.

COLORS AND COLORING

FAR too vast, needless to say, is the scope of the study of color sensations, for the above title to imply anything but a few very limited considerations.

It belongs to the physicist, the methodical scrutator of the infinite color world our eye pierces, to state the fundamental division that science has established between these colors: *light-colors*, extracted by a prism from a ray of white solar light that is refracted therein, or again, the magic of which is no less wonderful, by the phenomena of iridization or capricious breaking up of this same white light by the extraordinarily thin lamina of a coat of metallic oxide, as by the imponderable pellicle of a drop of oil widely spread over a damp support; then: *pigment colors*, those of all the animal, vegetal, and mineral elements in nature offered to our sight. The infinite diversity of pigmentary substances communicates to each thing in the infinity of cases, the property of likewise extracting from white light and of exclusively reflecting its own specific tint.

Then, on the chemist, the successor of the empirical craftsman of the past, but with the degree of science our age has attained, falls the task of imitating the work of nature; it is for him to obtain from his retorts and stills the penetrating and sufficiently tenacious products, which, on impregnating mainly such objects as those within the textile domain, will give them the required colors by the above-mentioned pigmentary effect. The whole art of dyeing is but that, and had its birth in the first gropings after the imitation of natural colorings.

The observer is then left with license to cast a comparative glance over the dyeing of bygone days and that of to-day to compare the arsenal of our present-day specialists, composed as it is of extensive works built up on mechanical plant and learned chemistry, with the very simple means that long sufficed their elders. A world of discoveries and improvements separates the former from the latter. We have moved ahead along the highway of dye-product production since, for instance, the days of chance discoveries, consecrated by anecdotes. Classical and inevitable is the one about the Phoenicia dog: coming back to his master his mouth reddened by the juice of the *neurex* he had chewed along the seaside, the unconscious quadruped found itself in the position of the inventor of purple, whose career has been so glorious in the history of textiles and even in history as a whole.

It was not only shells, and in addition, tiny insects like the cochineal Kermès, early used under the name of scarlet seed for an excellent red dye (Kermès, from the Arab *Kirmiz*, has given *chermetruo* in Italian, and later our *cramoisi*) which formerly provided dyestuffs. Everyone knows that the vegetal kingdom so rightly indicated by the earliest experiences, could provide them equally well. Thus, sometimes the leaves or flowers, sometimes the bark or wood itself of numerous plants were the reservoirs whence, with more or less ability, were obtained coloring products, some of which at least, were long used. Cited at random, logwood, madder (long a source of wealth in the South), pastel, woad, mock-saffron, etc., and above all the celebrated indigo, are but the main ones.

In short, these dyestuffs, having a vegetal basis, strengthened of course according to other principles concerning the use of a few mineral products, metallic salts for instance, were still being used in the early part of the nineteenth century, and were based on a chemical science still at its dawn. By launching into the domain of artificial dyestuffs, this science was soon, however, to develop in an extraordinary manner.

In this connection we shall not again take up the strain of homage—though more than deserved—to Verguin, who in 1858 obtained from what was then called aniline, the famous and red fuchsine, exploited by the brothers Renard who were thus the sponsors of it. The genesis and strictly conducted research of modern tinctorial science are now known to all. All see the results of same: that is, the richness, extreme variety and most delicate gradations of the range of shades available for coloring textiles in particular: wool, cotton, silk and their substitutes. Is there any need to point out to what extent this last category has, by definition, been the chosen sphere for practice in the production of colors, of which it shows up the beauty in an admirable way.

There has thus been considerable and undoubted progress as regards color range and finesse of tones in the present-day art of dyeing. This success, however, no harm in saying so, is less marked with respect to the fastness of the beautiful new tints and even the classical ones. In ancient times and after, there were surprising instances of resistance and permanence of colors applied to textile stuffs. This concern for fixity has now passed into the background; the day has now gone by for the guarantee "fast dye" that Oberkampf, the founder of Jouy, and his rivals had proudly stamped on their printed calicos. And to-day, with respect to woolen or cotton goods in daily use, more and more research is being carried on for the quality "indégorgeable" (fast dye) that is less and less attained despite the promises of somewhat deceptive labels. In truth, the matter is not so important as in former times. Seeing that in all or almost all aspects of the way of living nowadays, duration is no longer a factor that comes prominently into play in everyday considerations, what's the use of weaving and dyeing for the future? Apply ourselves to the present, to its rapid and fleeting realizations. Let us adopt the system that comes to us from across the Atlantic, as well as the discordant sonorities of jazz bands and the more pernicious raptures of cocktails! People no longer wash, nor clean, either clothes or fabrics; they just throw away and joyfully replace. *All right* and *forever!*

Otherwise, and avoiding all dangerous exaggeration, there are cases in the domain of silk fabrics, particularly those for furnishing purposes, which require that the

colors be fast-dye, and by the precaution taken and certain manipulations specially carried put, this fastness is normally assured. One realizes that for dress materials subject to the rhythm of frequent renewal, the fleeting nature of the dyes is of small account. As already said, it is amply compensated by the richness of the palette, whereon one has but to choose according to the taste of the day and the trend of fashion. It is an incomparable resource for exercising the charming but difficult art of associating the colors in one and the same fabric and its decoration, or, put briefly, color-combining.

From earliest times men have applied themselves to it, with such results as are revealed by so many diverse vestiges, that are, in short, the reflexions of successive civilizations.

In this connection one might carry out a long comparative study, the material of which would be abundant. One of the first remarks to be made would concern the certain value of color combinations in the past, notably those of the East though obtained with the feeble resource of a few simple colors, in relatively few shades and much less intimately mixed. For the rest, as to the results, it is a matter of taste, of limited technics, and also of the patina stamped thereon by time and that is not to be overlooked.

One may suppose that for a long time the associations of colors in textile materials, just as in other artistic departments, were not much subject to any other rule than that of spontaneous fancy, guided by experience and the subtlety of appreciation. At certain other times the aim was to incite to a more faithful imitation of nature. The Lyonnese School in the eighteenth century having succeeded in figuring on silks, flowers modeled in the image of natural ones, was often inclined to color them, so far as was then possible; this copying of nature in color combination, despite very clever efforts, was, of course, influenced by the very limited variety of colors in use, and has figured as conventional coloring. It was nevertheless a further step forward, alongside of other incitements and experiments.

Then, scientific inquiry and reflection came into play, and gradually cast over the notions acquired by pure empiricism, the fruits of observation and methodical experiment in the laboratory. There have not even been only scholars, and great ones like Newton, the inventor of the *chromatic circle*, to take up these fascinating problems. A practician, namely, Gaspard Grègoire, the inaugurator of the painted velvets that bear his name, has constructed a *Table of Colors* in his own way, and written a memorandum on the *Colors of Soap Bubbles*. Better still, a poet has let himself be tempted into undertaking a *Treatise on Colors*, and somewhere in this work Goethe has written, "In order to attain perfection in the art of coloring, the artist must consider the moral effects of colors, their physiological effects, their technical nature, and finally the influence exercised on them by environment. Colors influence the soul; they may excite sensations therein, awaken creations, and ideas, that calm or agitate us, and provoke sorrow or joy.

All very judicious observations, but in their essence of a speculative and philosophical nature.

In order to keep within the bounds of scientific experiment, we must above all not forget the importance of the works of the illustrious Chevreul. It is to him that we owe such studies as the *Simultaneous Contrast of Colors* and the formulating of remarks controlling the use of what are called *complementary colors*, remarks that forthwith became law among all whose work was to distribute color combination in all its expressions.

It is indeed why Chevreul, at the request of the Society of Agriculture, Natural History, and Useful Arts, later of the Lyons Chamber of Trade, came into this town during two successive years, 1842 and 1843, to give lessons wherein he subordinated the exposition of the principles he had established to the applications that might be made of them in the manufacture of silk fabrics. Further, following on this course of instruction he wrote the *Theory of the Optical Effects Presented by Silk Fabrics*, a work printed and published in 1846 under the auspices of the Lyons Chamber of Trade. The learned observer has assembled therein the result of very thorough and very precisely controlled visual experiences on samples of manufactured silks that were submitted to him or that he even had made according to his own instructions. He has studied therein both the optical effects of satin, velvets, reps, toile de soie, "florence," marceline, poult-de-soie, gros de Naples, taffeta, and all other ground weaves under the names they then bore, and those of figured, watered, and glossed silk fabrics; this latter chapter, a well-developed one, might still be meditated, for here and there, are observations not lacking in interest, as, for instance, this one picked out at random. "Should glossed fabrics with a white woof have warp threads in colors of very weak tone, they might have a real superiority over glossed fabrics with a white woof of which the warp is in a color of a higher tone."

To what extent have the precepts established by the method of Chevreul proved of practical aid in the domain of silk? It would be difficult enough to estimate it. His *Treatise* has become more a library volume than a frequently consulted manual, as may be understood. At bottom, the conditions under which experiments are carried out in the laboratory, even though such experiments furnish points to be remembered, necessarily cannot correspond to the great diversity of uses to which fabrics and coloring of same give rise. And the experimenting, empirical if you will, but practiced and multiplied daily, does it not furnish a body of results wherein we have but to compare and choose?

And this brings us back to the truth of a previously recalled fact: that this choice may and must be mainly guided by a natural and spontaneous gift. It is certainly not to pooh-pooh the usefulness of directing principles, acquired or engraved, to proclaim the obvious superiority

of an inborn quality. A man is born a colorist, and he is a cook . . . or poet! This or that man, well gifted, may, by training in a suitable environment, succeed in accomplishing the task with due honor, but his work will often be lacking in that just-rightness, that true and seductive harmony, sometimes even that daring and piquant originality, more easily attained by this other, better provided with the finesse and perspicacity of taste.

This latter is revealed, already highly developed, in what is called the choice of tints of a plain fabric, and better still in the preparation of those shade cards, to-day most extensive and widespread repertories which, each season, so facilitate the determination of preferences. Fashion, of course, always indicates hers; she baptizes, mainly according to the taste of the day—the special vocabulary has extended the most constant fancy—the shades she adopts while declaring them to be new. Renewed is what we should say, thinking the while of the considerable number of tints which, in the case of silk alone, have already been given to it, as though to imitate prodigious nature: distinct shades, called simple or pure, mixed, intermediate, and softened shades, and such as have a glow of other shades, etc. Though we have to-day attained sufficient precision to overcome the difficulty of obtaining conformity between two hanks, or pieces of silk, we are none the less faced with certain problems: as is known, to dye separately and exactly match two blacks, that negative color, tomb of all others, is a problem almost insurmountable; two whites, under the same conditions, obstinately present to the very expert eye, such tiny differences, but differences none the less.

Only such as have the scruple to accomplish these tasks in so perfect a way can pay heed to these details of execution. In practice, silk, with its play of a thousand colors that it animates with its brilliance or yet tempers with its desired deadness, offers the colorist the most supple means of displaying his talent in diverse degrees. Whether we consider the most modest material or that of which the textile construction renders it suitable for all the wealth of decoration, by lustering, fancy weaving, or yet by the almost inexhaustible resources of printing, our specialists—let us say so with legitimate pride—have become masters in the art of handling and associating colors. Lyons and Paris are the centers to which the whole world, eager to catch the least indication in this matter as in so many others respecting elegance, hastens to come to listen to the major and vibrating note to which they will then strive to tune their instruments.—*Soirie de Lyon.*

Card No. 553-A of the Society of Chemical Industry in Basel, fast to boiling pyrogene dyestuffs, corresponds to prior card No. 553 but has been enlarged by new dyestuffs and fastness tables. Only such dyestuffs as would stand laundering in 5 grs. soap and 5 grs. soda at 90° C. for one-half hour with intermittent rubbing on a wash board are represented and illustrated with dyeings.

Technical Notes

Colorimetric Determination of Alizarine Dyestuffs in Lake Condition Upon Cotton

W. Minajeff and K. Swietliakow; Mell. Textil-Ber. 10, 796 (1929). — Liebermann's (Liebermann and Michaelis, Ber. 27, 3009) gravimetric method of determination of the alizarine (and similar dyestuffs) present in dyed materials is a round-about one, and attended with certain difficulties. The above authors have worked out a colorimetric method which can be followed out and completed in a short time, without difficulty, and with small swatches, while the Liebermann method requires as much as 1 or 2 square meters of the goods to be tested. This colorimetric method depends upon the destruction of the fabric and of the color lake by treatment at ordinary temperature with 70% sulphuric acid, the addition of caustic alkali to neutralize the acid and to dissolve the dyestuffs to the characteristic blue-violet color, and the comparison of this solution, in the colorimeter, with a standard solution. The authors state that they "have left nothing unregarded; the influence of an excess of caustic upon the intensity of the blue-violet color, which Liebermann noticed, and which has, even up to the present, received no satisfactory explanation; and the question as to how far the cellulose in the alkaline solution has any bearing upon the color, for which reason we have in several cases used standard solutions with cellulose added."

In four experiments, which are given in detail, the results checked within 2.1 and 2.2%, 0.7 and 1.1%, 1.1 and 0.4%, and 1.0 and 1.6%, which for technical analyses on such materials and for such purposes is a fairly good check; at all events, sufficiently good for all ordinary purposes. These results were obtained with pure alizarine as a preliminary testing-out of the accuracy obtainable. It was found, on extending the method to dyed material, that the solution prepared from the dyed fabric to be tested became lighter on standing for some time before examination in the colorimeter. The authors suggest tentatively that this may be due to the formation of sugars from the action of the acid upon the cellulose in the destruction of the fiber, and that these sugars, if given time, may reduce some of the alizarine to the leuco condition. They only suggest this, but the suggestion appears to be reasonable. The colorimetric determination has therefore to be made, not necessarily immediately but without delay. A table is given showing the drop in apparent percentage of alizarine through keeping the standard (containing cellulose disintegrated by sulphuric acid); the value ranges from 100% on immediate examination, through 99.7% after two hours' standing (and the same figure after twenty-four hours), and 95.2% after five hours' standing, to only 81.5% after forty-eight hours' standing.

Like all colorimetric methods, a certain amount of

experience is necessary before good checks can be obtained. When a mixture of alizarine dyestuffs has been used, of course the same mixture must be employed for establishing the standard. The method can be used for examining different parts of a long run, for uniformity of dyeing, in which case a selected portion of any part of the run may be taken as standard and samples of other portions compared with it.

Determination of Active Chlorine in Hypochlorite Liquor

Dr. A. Ehrenfried; Mell. Textil-Ber. 10, 801 (1929). The ordinary method, that of titrating the liquor with 1/10 N arsenious acid or sodium nitrite, and recognition of the end-point by spotting upon starch-iodide paper, has the two disadvantages: that the end-point involves "spotting," always to be avoided if possible, and that some hypochlorite liquors may decompose to an inconvenient extent even during the titration, besides the fact that the liquor must, for the same reason of great instability, be titrated as soon as the sample is drawn. Dr. E. proposes the following method: A sample of the hypochlorite liquor is treated at once with a known volume of 1/10 N arsenious acid in excess, and after addition of a few drops of methyl orange solution, as indicator, strongly acidified with hydrochloric acid and the excess of arsenious acid titrated back with 1/10 N potassium bromate. The end-point is recognized by disappearance of the red color of the indicator as a result of the liberation of bromine at that point.

The results agree entirely with the Pennot (ordinary spotting) method. A great advantage is that after addition of the arsenious acid solution, the mixture can be left indefinitely (in the laboratory sense, of course) before titration; so that, as is often necessary, the titration of different lots of liquor may be carried out simultaneously.

The "Hydrosulphometer"

Dr. R. Feibelmann and Dr. W. Meves; Mell. Textil-Ber. 10, 804 (1929).—A description of a piece of apparatus for rapid (not exact, but sufficiently close for ordinary purposes) determination of the percentage of hydrosulphite in commercial samples. The apparatus consists merely of a glass-stoppered cylinder appropriately graduated. For use, 1 g. of the sample is placed in the cylinder and the latter then filled with boiled water to the first graduation, the mixture then being stirred, not shaken, until the sample has completely dissolved. A standard solution of ferric sulphocyanide is then cautiously dropped in until, after instant decolorization, the next portion retains its blood-red color. The part of the glass cylinder above the first, or zero, mark being appropriately graduated (each mark representing a step of 5%), the point to which the now tinged mixture has attained gives the reading of the percentage of hydrosulphite directly. Judging by the cut given in the article, it ought to be easy to read to 1%. The apparatus is furnished by the Chemische Fabrik Pyrgos, G. m. b. H., Radebeul-Dresden, and is patented.

Parallel Reactions of Starches and Cellulose

Dr. Paul Wergraf; Mell. Textil-Ber. 10, 805 (1929).

Action of Nitrogen Tetroxide Upon Lignin and Cellulose

Dr. Alfred Schaarschmidt; ibid. p. 806.—The first a short paper read before the Verein der Chemiker-Coloristen, the second an abstract of a paper read before the Verein Deutscher Chemiker in May, 1929.

Contributions to Our Knowledge of Silk-Weighting

Dipl.-Ing. W. Stockhausen; Seide 34, 277 (1929).—A paper of theoretical nature, a review of the three major methods of silk-weighting—the mordanting, phosphate and silicate processes. The scanty literature bearing upon the subject is reviewed, and every phase thoroughly discussed. There is much practical information incidentally interwoven with the discussion. The statement made in the introduction, to the effect that the most efficient and successful method, the tin-phosphate-silicate method, used for a short time, produced remarkably fine results, until in a short time, the weighted fabric simply fell to pieces under the influence of the loading, has to us a humorously pathetic sound—elaborated efficiency without regard to the inherent weakness of the substratum! More things than silk have crumbled under logical but irrational "weighting."

Maschinenspinne 8122—Optical Apparatus for Textile Laboratories

Seide 34, 289 (1929).—Although it is not the intention of these columns to advertise apparatus or materials for sale by a named firm (though we have already done so a little above), it seems necessary to give notice of a new apparatus designed for the photo-micrography or projection of textile materials, now on the market under the above title. The article cited above shows five cuts of the apparatus as arranged for different purposes and nine cuts of textile samples as displayed for examination by it.

The instrument itself may be described as a somewhat simplified compound microscope mounted upon a base and column in such a way that it can be directed at almost any angle, and used with a camera attachment for "straight" photo-micrographs or, by means of a special illuminating lamp, for throwing the enlarged image in a darkened room upon a suitable screen, large or small, vertical or horizontal, or upon a sheet of photographic paper. By suitable arrangement of the different parts of the apparatus the mate-

rial under examination may be examined microscopically, or thrown upon a screen or photographed by transmitted or by reflected (or direct) illumination, or by both at the same time. One advantage shown in two of the cuts is the possibility of preparing the textile material upon a micro-slide upon which has been etched a millimeter scale with subdivisions, so that the resulting photograph would make most easy the often troublesome counting of easily disturbed fibers or the measurement of the various elements of the weave. This work can be carried out, of course, even with the cumbersome photo-micrographic apparatus at present used in laboratories which need not care for expense; but it would seem that the present apparatus could produce equally good results and at a much less expense for apparatus, for the cost of the present arrangement is only about R. M. 400 (about $100). It is made and sold by the Gesellschaft fuer Spinnerei u. Weberei-Einrichtungen m. b. H., Berlin-Charlottenburg, Germany.

New Devices for Microscopical and Chemical Analysis of Fibers

Dr. Alois Herzog; Kunst-Seide, 11, 335 (1929).—An illustrated description of several bits of apparatus which the author has used for some time in his textile studies, with directions for their use. They comprise a sectioning block for the rapid preparation of cross-sections of fibers according to the rapid procedure of the author, a quadrant-ruled glass plate for the determination of the titer of fibers (to be used with photo-micrographs of definite magnification), a "planimeter-table" for determination of the area and fineness of cross-sections, a triangular ruler useful for linear measurements, specially ruled objective slides for determining magnification, etc., and other special devices.

The Theory of Dyeing Acetate Silk

Herbert Brandenberger; Kunst-Seide 11, 338 (1929). A theoretical paper of much interest. Sixteen figures (some of them combined) and a considerable number of tables are given. The paper is not suitable for abstracting. It may be noted, however, that the author concludes for the solvent theory of Witt that the dyestuff is "dissolved" in the solid substance of the fiber and not adsorbed.

Vat Dyestuffs of Quinone Nature

German Patent No. 445,270; *L. Cassella & Co.*—The dyestuffs of this series are produced by condensation of aryl quinones or their derivatives, especially their halogen derivatives, with amino-thio-phenols of the aromatic series, containing the SH group in the 1- and the amino group in the 2-position, while the 5-position is substituted by a more or less substituted amino group (one H replaced by an aryl radical and the other H either not replaced or replaced by an alkyl or aralkyl group). The products are designed for use upon wool, and give mostly violet to greenish-blue tones of great clearness and good fastness. Five examples are given.

Color Correlation Chart

According to an announcement made by Margaret Hayden Rorke, managing director, the Textile Color Card Association has just issued its Color Correlation Chart for the 1930 spring and summer seasons.

The chart will serve primarily as a guide to retailers in effecting the correct color co-ordination between the costume, the hat, and other complements of the ensemble, such as the shoes, bag, gloves and hose. It is to be used in conjunction with the 1930 Spring Season Color Cards already issued by the association. The colors referred to in the chart appear, with few exceptions, on the above cards.

Included in the list are the shades which leading apparel industries have chosen for spring and summer promotion.

The outstanding color families for day-time and evening wear are divided in groups according to their cast, and for each group are suggested the fashionable shades in shoes, hosiery and other accessories, which properly match, blend or contrast with the dominant color note of the costume.

A special feature of the chart is a collection of fashionable bi-color themes adaptable to town, sports and beach wear.

From a merchandising angle, the chart is designed to assist the retailer in carrying out an effective color correlation plan in the apparel and costume accessory departments of the store. It is intended as well as a guide to the sales staff in assisting the customer to choose accessories in the correct colors to complete her ensemble.

Herman A. Metz Textile Prizes Awarded

The future of the textile industry is in the hands of the generation now coming on. Progress in textiles in future years will depend upon the knowledge and skill of the present recruits to this vast and complex industry.

With the intent of fostering proficiency in their chosen field, the Hon. Herman A. Metz offers a series of awards to the graduating classes of Textile High School. At the recent Commencement Exercises the names of the winners were announced: Batik and Dyeing—First prize, Hyman Bader; second prize, Mary Bekoff. Chemistry and Dyeing—First prize, Isadore Michaelson; second prize, Samuel Sturim.

Standard Brands, Inc., announced the removal of their executive and general offices to the Fuller Building, 595 Madison Avenue, New York City.

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i. e., help wanted, machinery or supplies for sale—the rate is $5.00 per column inch or less per insertion.

POSITION WANTED BY DYER

Young man with experience dyeing Cotton and Rayon Sewing Thread with Naphthol, Indanthrene, Sulphur, Developed, Direct and Basic Dyes. Address: Classified Box No. 579, American Dyestuff Reporter, 440 Fourth Avenue, New York, N. Y.

RAYON SKEIN DYER

Rayon Skein Dyer with 20 years' experience dyeing all kinds of rayon desires position in or near New York City. Address: Classified Box No. 580, American Dyestuff Reporter, 440 Fourth Avenue, New York, N. Y.

COTTON AND RAYON DYER

Position wanted by Cotton and Rayon Dyer; 19 years' experience dyeing warps, skeins and mercerized yarns, with Napthol, Indanthrene, Sulphur, Developed, Direct and Basic Dyes. Best of references. Address: Classified Box No. 587, American Dyestuff Reporter, 440 Fourth Avenue, New York City.

POSITION WANTED

Man with twelve years' experience in cotton piece goods desires position as dyer or assistant superintendent. Address: Classified Box No. 588, American Dyestuff Reporter, 440 Fourth Avenue, New York City.

ASSISTANT IN LARGE MILL

Young man with seven years of practical hosiery dyeing experience wishes to take charge of dyehouse in small firm or as an assistant in large mill. Address: Classified Box 585, American Dyestuff Reporter, 440 Fourth Avenue, New York City.

POSITION OPEN

Experienced Dyestuff Salesman for good territory open in Boston district; must have real selling ability and buying acquaintances; this is a real opportunity for right man. Replies held confidential. Address: Classified Box No. 586, American Dyestuff Reporter, 440 Fourth Avenue, New York City.

CHEMIST AND DYER

With long practical and scientific experience in the bleaching and dyeing of fast colors on cotton yarns, warps, rayons, Celanese, silk, piece dyeing and finishing. Capable of taking full charge and managing either a mill or commission dyeing or finishing plant. Able to conduct both scientific and practical research along these lines. Desires to connect with reliable concern where ability to produce good work and bring out new things will offer opportunities. Address Box 589, care of American Dyestuff Reporter, 440 Fourth Avenue, New York City.

Roots Merges

The P. H. & F. M. Roots Company, original patentees and for seventy years manufacturers of rotary positive blowers, pumps and meters, has merged with other interests and is now under the control of the Stacey Engineering Company, of Columbus, Ohio.

The new organization includes the P. H. & F. M. Roots Company and the Connersville Blower Company, both of Connersville, Ind.; the Wilbraham-Green Blower Company, of Pottstown, Pa., and the Stacey Brothers Gas Construction Company of Cincinnati, Ohio.

Heading the list of officers, Colonel Carmi A. Thompson, of Cleveland, was elected president; Corwin Abbott, vice-president and general manager; Fletcher S. Heath, of Columbus, Ohio, vice-president; and Erle G. Meeks, secretary and treasurer. Charles T. Gordon will continue as general superintendent.

E. D. Johnston, who for the past forty-five years has been connected with the P. H. & F. M. Roots Company, has resigned as president of the company, and has retired from active business.

The new board of directors consists of Colonel Thompson, F. S. Heath and C. A. Ward of Columbus, Ohio; W. B. Stacey, of Cincinnati; J. T. Wilkin, Corwin Abbott and Charles T. Gordon of Connersville.

All companies involved in the merger will maintain their separate identities and organizations, and will continue to operate separately until the final plans of the merger can be consummated.

Ciba Announces Move

The Ciba Company, Inc., makers of "Dyes for Master Dyers," has located general offices, laboratories and warehouse at the southeast corner of Greenwich and Morton Streets, New York City.

The new mail address is Box 200, Varick Street Station, New York City. And the new telephone is Walker 1133.

This latest expansion of this old and famous dyehouse gives their customers the benefit of the most thoroughly modern laboratory and warehousing facilities. The Morton and Greenwich Streets corner means perfect accessibility to office and warehouse. At Christopher and Greenwich are the Ninth Avenue "L" and Hudson Tube stations. The Seventh Avenue subway station is at Christopher Street. The I. R. T. subway station is at Houston Street. The Holland Tunnel and all downtown ferries from New Jersey make trucking quick and convenient.